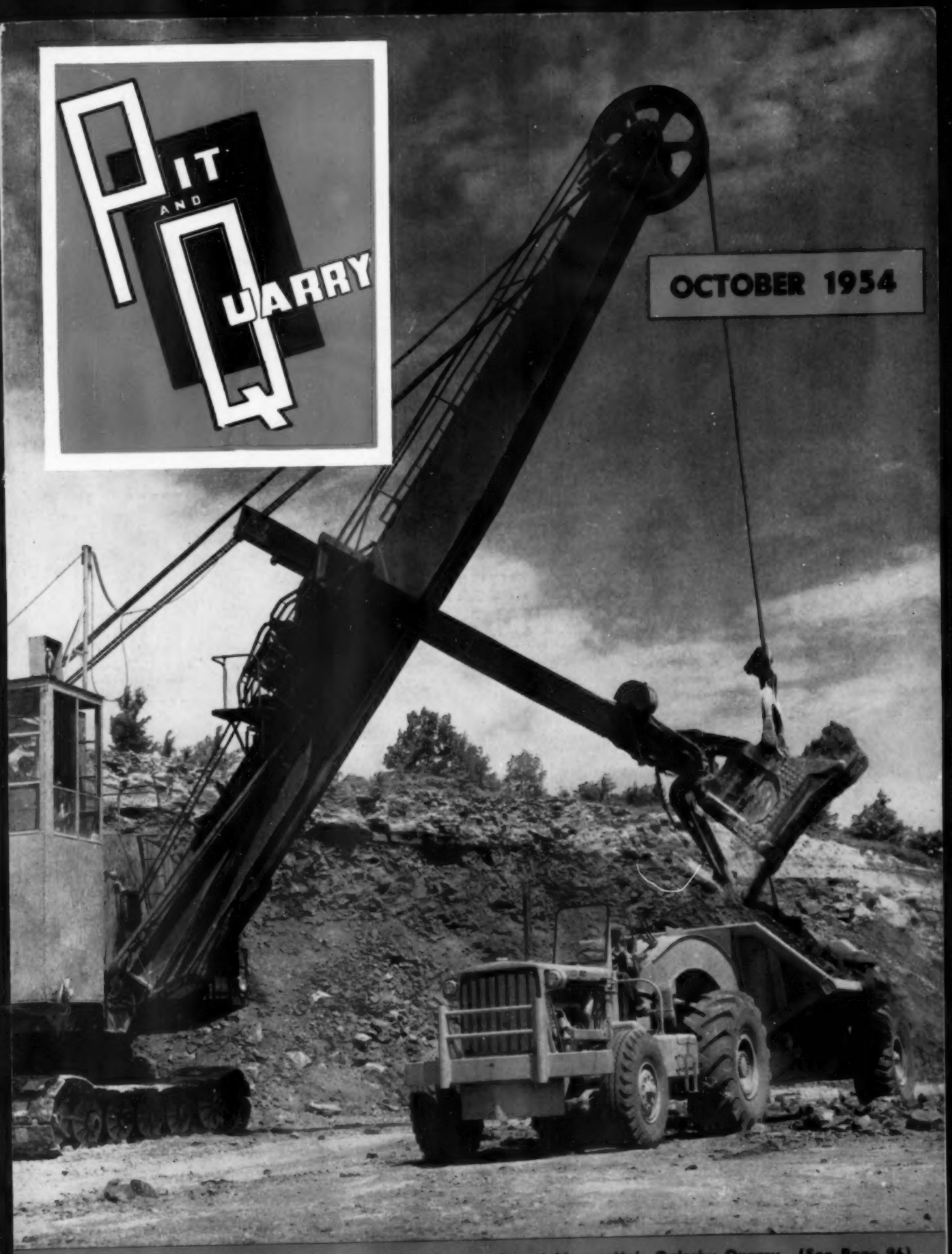
PIT AND QUARRY

OCTOBER 1954



Some of the Equipment Used in Stripping 120-ft. Overburden at Marquette's Oglesby Quarry. (See Page 96).

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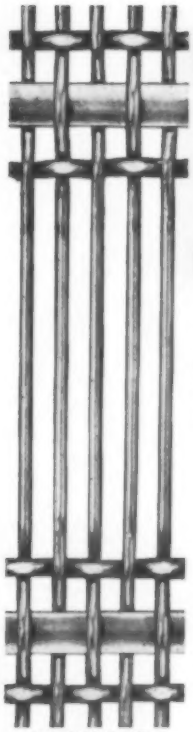
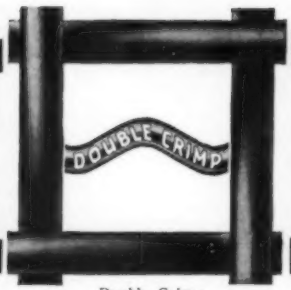


No. 5404 Sta-Tru

Arch Crimp



Double Crimp

Sta-Smooth

Arch Crimp Rek-Tang

SUPER-LOY

SQUARE OPENING and LONG OPENING WOVEN WIRE SCREENS

withstand abrasion endure vibration

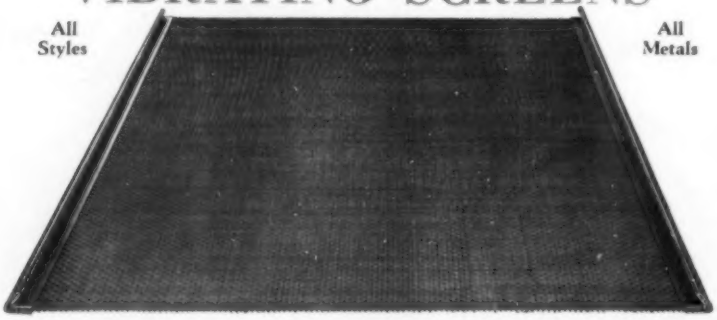
resist fatigue

— o —

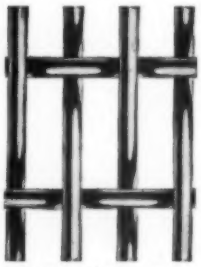
HOOK STRIPS FOR VIBRATING SCREENS

All Styles

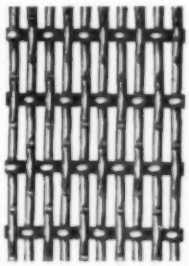
All Metals



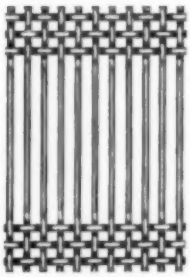
Write for catalog listing square-opening screens and wire cloth carried in stock, and showing full information for ordering special requirements made up to your exact specifications.



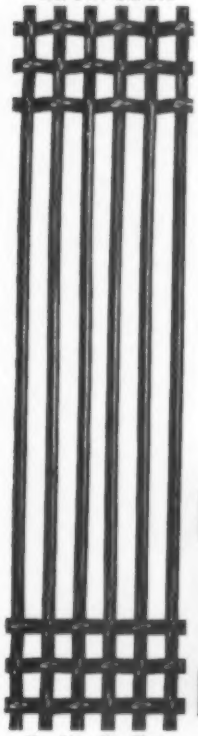
Sta-Smooth Rek-Tang



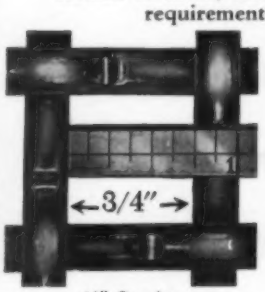
No. 95 Rek-Tang



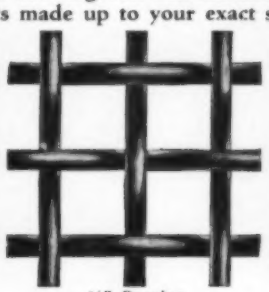
No. 7159 Sta-Clear



No. 7110 Sta-Clear

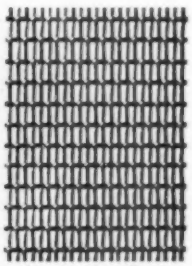


¾" Opening



⅜" Opening

½" Opening



No. 221 Rek-Tang

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LINK-BELT offers you the "total engineering" so necessary for top efficiency

DESIGNED FOR OVERALL EFFICIENCY

Because of its unrivalled experience, Link-Belt can do a better job of gathering and analyzing all data. Proposals reflect this understanding of the most practical way to fit conveyors into your overall system requirements.

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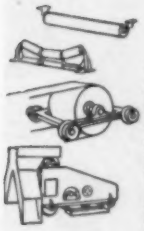


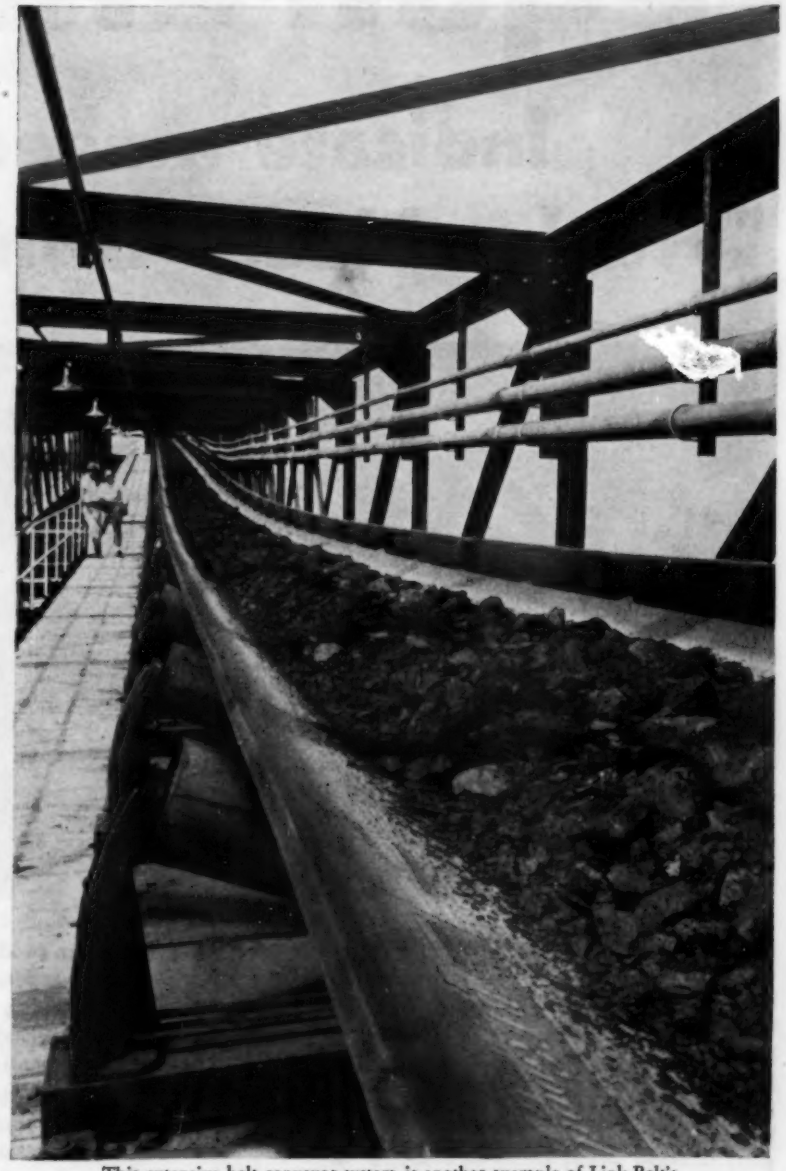
Link-Belt manufactures all components and related feeders and conveyors. You are assured of the right equipment because of this breadth of line. And Link-Belt will supply the highest grade belts engineered to the job.

DELIVERS FULL RATED CAPACITY

Link-Belt follows through on every detail of the job, including electrical controls and even wiring and foundations. What's more, Link-Belt will furnish experienced erection superintendents, staffs and skilled crews if desired.

ASSURE SATISFACTORY PERFORMANCE

When you rely on Link-Belt as a single source for your complete system, Link-Belt accepts responsibility for placing it in full operating readiness. We will also supervise modernization of existing systems.



This extensive belt conveyor system is another example of Link-Belt's preparedness to solve bulk handling problems, either large or small.

WHETHER it's a single belt conveyor or a complete system, there's no substitute for Link-Belt equipment and Link-Belt engineering. Call the district sales office near you for all the facts on this unique single-contract service.

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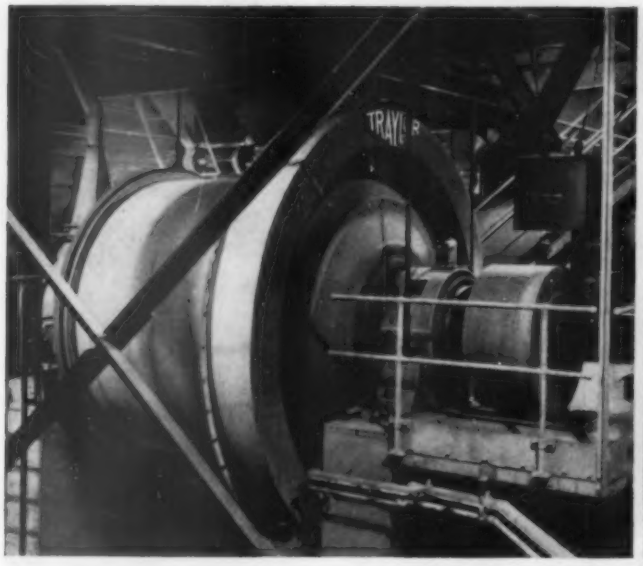

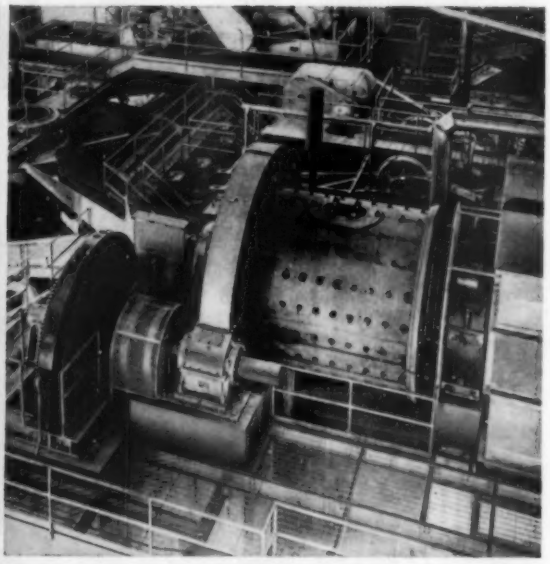

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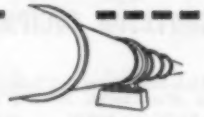
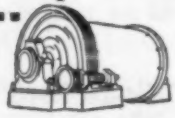
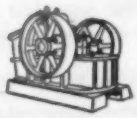
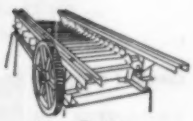

Rotary Kilns

Secondary Gyratory Crushers


Ball Mills


Jaw Crushers


Apron Feeders

They rolled up a 37% saving on this tough quarry job

MOVING up to 225 tons of crushed stone an hour—day in, day out—battered the life out of this Midwestern firm's previous conveyor belts in just a year. Annual re-belting became an expensive proposition.

Then they called in the G.T.M. — Goodyear Technical Man. His recommendation was a Stacker-quality Goodyear belt with heavier covers and breaker strip — even though its initial cost ran a little higher than predecessors.

The pay-off? The Goodyear belt stayed on the job four times as long as previous installations. It not only paid back the slight extra cost in short order — *but slashed over-all conveyor costs by more than a third.*

Yet there's nothing unique in this report. Goodyear belts are incredibly rugged. They resist abrasion, cutting and gouging. And they are mildew-inhibited. So they're bound to give trouble-free service—throughout their extra-long life.

And remember, the G.T.M.—backed by products of this Goodyear super-quality—has your best solution to *any* problem involving conveyor belts or other industrial rubber items. Contact him through your Goodyear Distributor or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

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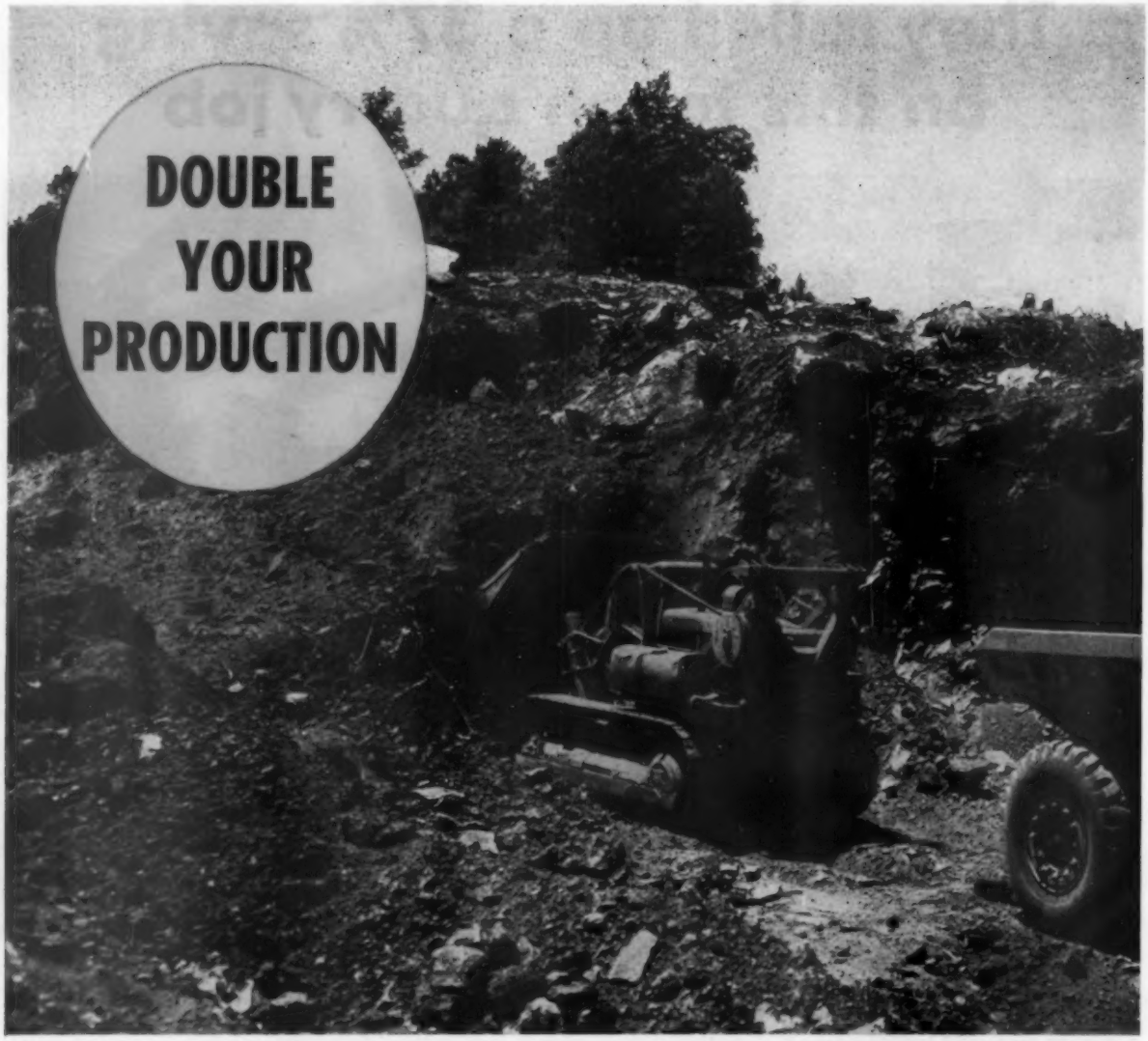

Digging in heavy rough rock, conglomerate, unbroken sedimentary material or clay is hard on equipment doing the excavating. To stand up under this work day in and day out, the excavating equipment must be specially designed.

Eimco had these jobs in mind when the 105 was designed and its excavating attachment will do many jobs previously possible only with large, expensive boom type equipment.

The illustration above shows excavation in hard red clay without preliminary drilling and blasting. Average production is better than 150 trucks per day, better than double the production of conventional front end loaders with equal weight and horsepower on the same job.

Eimco 105's with Eimco excavating attachment or other attachments do a spectacular job. Let us show you a 105 at work near you.

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8-10

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Why not find out for yourself? Call your nearest Roebling office or distributor for a Field Man. He'll recommend the ropes that perform and stand up best in the quarries. And you'll learn what service really means!

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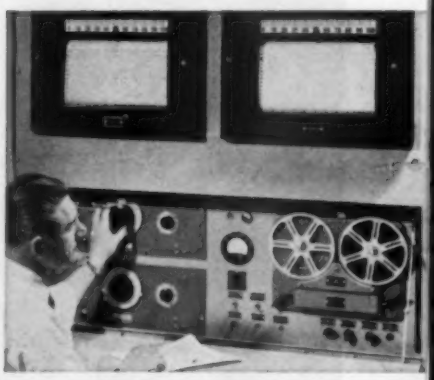
To prove it, we capsuled a multi-thousand acre proving ground into one room. Here our engineers can put 50 years of experience in building axles for trucks, buses and trailers to work—subjecting axles and gearing *indoors,* to any *outdoor* operating condition.

Such exacting research pays off for you in: longer axle life; less maintenance, repairs and downtime; reduced operating expenses. This is why Timken-Detroit axles are preferred by manufacturers and operators everywhere.



How TDA proves axle quality in this "Torture Chamber"

We pick one of our axles at random . . . then duplicate a hauling condition, hour after hour, day after day . . . simulating half a million miles of the toughest driving situations in just a few days. Or "invent" a test like going uphill with a full load from California to New York nonstop. There is no other axle testing like it in the world!

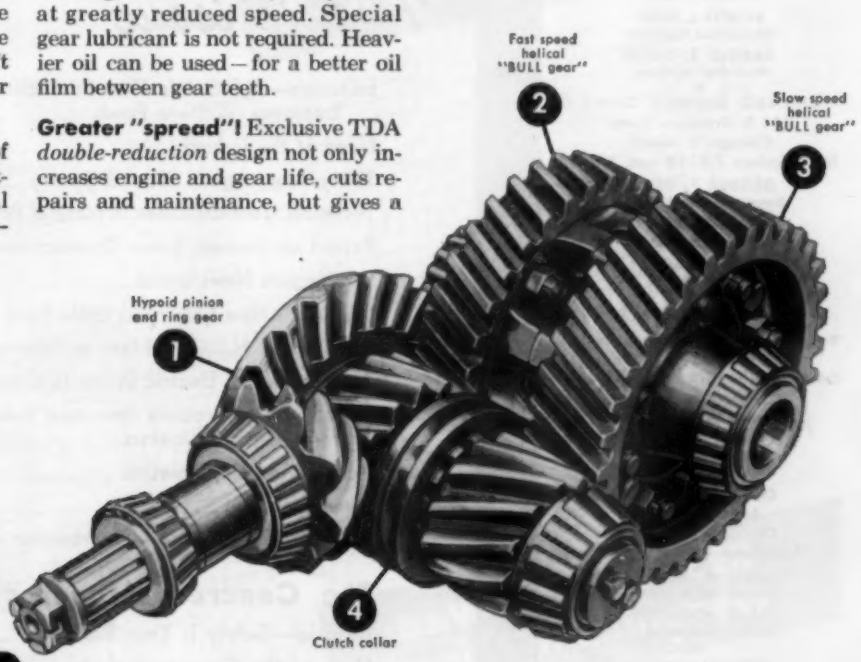
This is our "truck driver." He works in our "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!

How Timken-Detroit 2-speed axles with man-size gears, operate in any gear ratio ...indefinitely, without overheating!

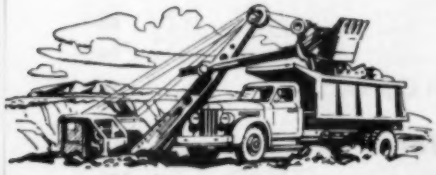
The secret? A husky hypoid ring gear and bigger, stronger pinion set (No. 1 in illustration) provides the *first step* of the total gear reduction for both fast and slow ratios. Two large, heavy-duty helical gear sets provide the *second step*. Both sets are of equal size and capacity—but one set (No. 2) is for fast speed—the other (No. 3) is for slow speed. The clutch collar (No. 4) moves to left or right to engage one "BULL gear" or the other.

The result: Complete elimination of small, complicated parts and midget-size gears! Larger hypoid-helical design gives more teeth in contact—reducing load per unit of contact area—for more positive, quiet operation. Bearings are larger. There's longer motor and truck life because wear on driving parts is less. When you divide the total gear reduction, you double its life expectancy. And the set of "BULL gears" not in use, always idles at greatly reduced speed. Special gear lubricant is not required. Heavier oil can be used—for a better oil film between gear teeth.

Greater "spread"! Exclusive TDA *double-reduction* design not only increases engine and gear life, cuts repairs and maintenance, but gives a vastly greater gear ratio "spread" for all jobs requiring any range of speed or power. A fast gear ratio for light loads everywhere—full loads on the level. Slow speed ratio for full loads on hills—for better pulling in "soft going."



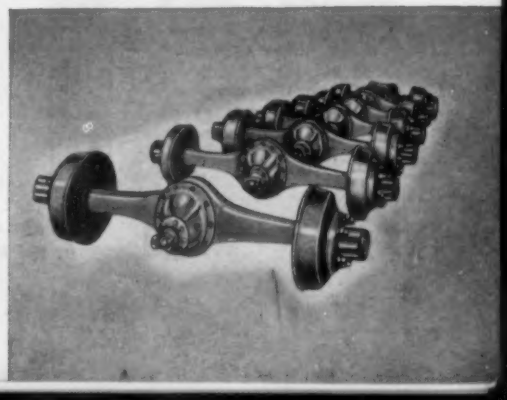
death



7 basic axle capacities! Only TDA, world's largest manufacturers of truck, bus and trailer axles offers a family of 7 basic axle capacities, each with *interchangeable* final drives: single-speed, single-reduction, single-speed double-reduction, and two-speed double-reduction, using the same axle shafts and housing. Nowhere is there such a selection to fit all special needs.

Exclusive "Torsion-Flow" shafts! Forged so that grain structure of steel conforms to shaft profile, thus assuring uniform distribution of stresses. Exclusive heat-treating formula provides a resilient axle shaft core graduated to a tough, hard outer surface—the ideal combination for axle shaft life. And TDA "Torsion-Flow" shafts are guaranteed for 100,000 miles or 3 years—whichever occurs first.

Hot-forged steel housings! Pound for pound the strongest, most rigid ever built! Rectangular TDA housing shape gives maximum strength, uniform stress distribution, minimum weight. Ask about the TDA "Life of Vehicle" guarantee.



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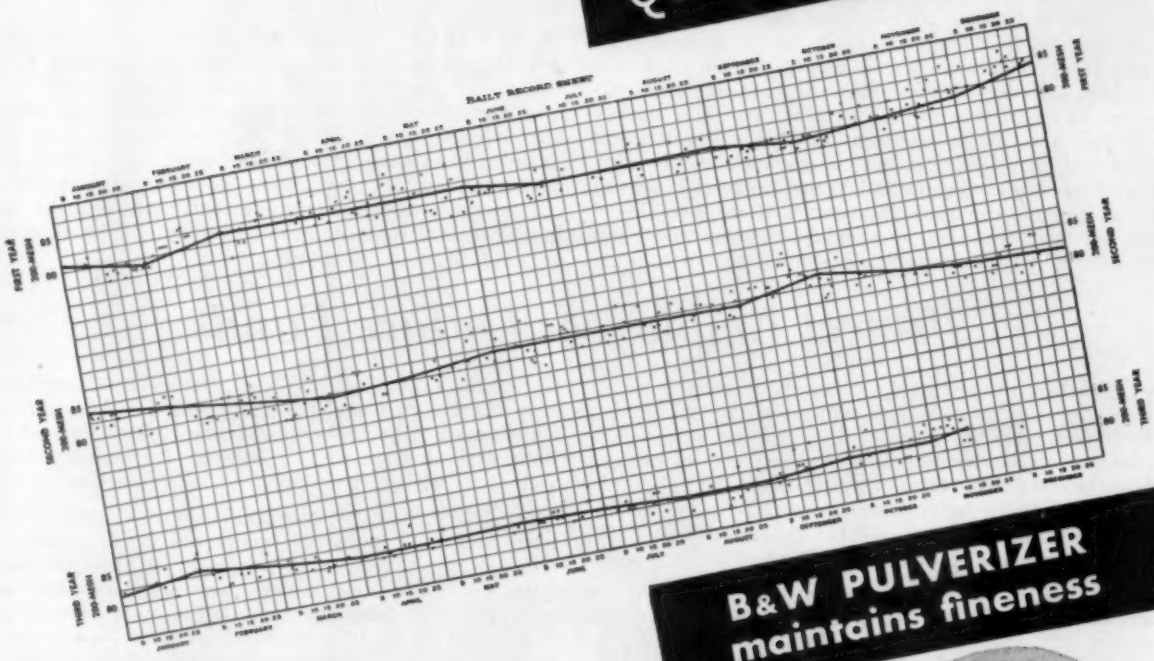


B&W PULVERIZER maintains fineness

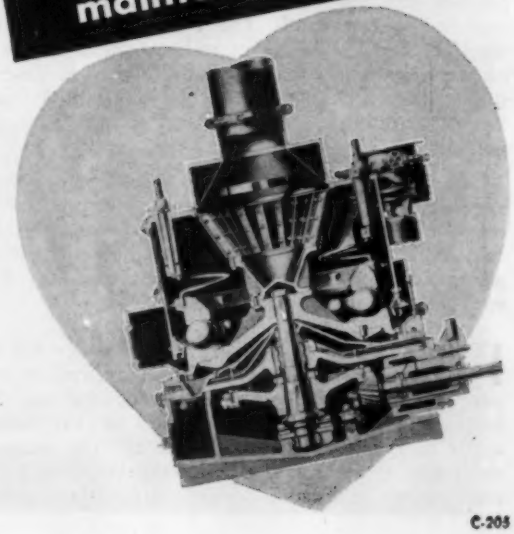


Chart shows record of a B&W Type E Pulverizer over a three-year period. The Babcock & Wilcox Company, Boiler Division, Process Equipment Department, 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX

C-205

editorial

N.S.G.A.'s First Production Survey

IN this issue is published the National Sand and Gravel Association's report on the results of its survey of the volume and value of commercial sand and gravel production in the United States in 1953. This is the first of a series of annual surveys which the association hopes will provide complete and accurate information on this important industry while it is still of value. Government figures, the only ones previously available, are lagging far behind, the report on 1952 having been released only recently.

In this first N.S.G.A. effort questionnaires were sent to 1,710 sand and gravel companies of record, and returns were received from 412 companies, or 24 percent. The return from member companies was 63 percent; it should have been 100 percent. The return from non-member companies, however, was only 17 percent. This is a shamefully poor showing of co-operation by a major industry which has an association ranking among the top trade associations in the country and having on its staff several of the nation's top trade association executives. These men and this association are noted for their integrity; and the definite promise was made—and kept—that in no case would the source of any information be divulged. We cannot believe that any of the 1,298 non-answering producers distrusted the association. Because this survey was decided on rather suddenly, and because questionnaires were sent out some months after the end of the year, we believe that producers were in the middle of their operating season and were just too busy to dig out old facts. In 1955 questionnaires will be sent out shortly after the first of the year; and, with the aims and objectives of the survey better known, much better results are expected.

ACTUALLY, although the returns represented only 24 percent of the known producing companies, these represented the bulk of the industry's capacity. Government and contractor production and industrial sand, which are included in the Bureau of Mines statistics, are not included in this survey. For this reason, and because this first survey was not as complete, no accurate comparisons can be made. Many interesting facts were brought out, however; and each succeeding survey will be of more value to all those interested.

Protect Employee Welfare Funds

THE Chamber of Commerce of the United States is urging employers to play a stronger role in assuming responsibility for administering the huge and swiftly-growing employee welfare funds, as one way to prevent abuses brought out in recent investigations. Welfare funds, generally financed by employers, now total some 22 billion dollars, according to reliable estimates. Some 11.3 million persons are covered by welfare and pension plans.

State and federal laws today fail to provide adequate safeguards for the protection of employees and their families or for beneficiaries of collectively bargained pension and welfare funds. This conclusion was reached by the Chamber's Labor Relations Department after a survey of statutory regulation in 35 industrialized states. This survey showed that a few states have limited regulation in their state insurance and labor laws, while others have none at all.

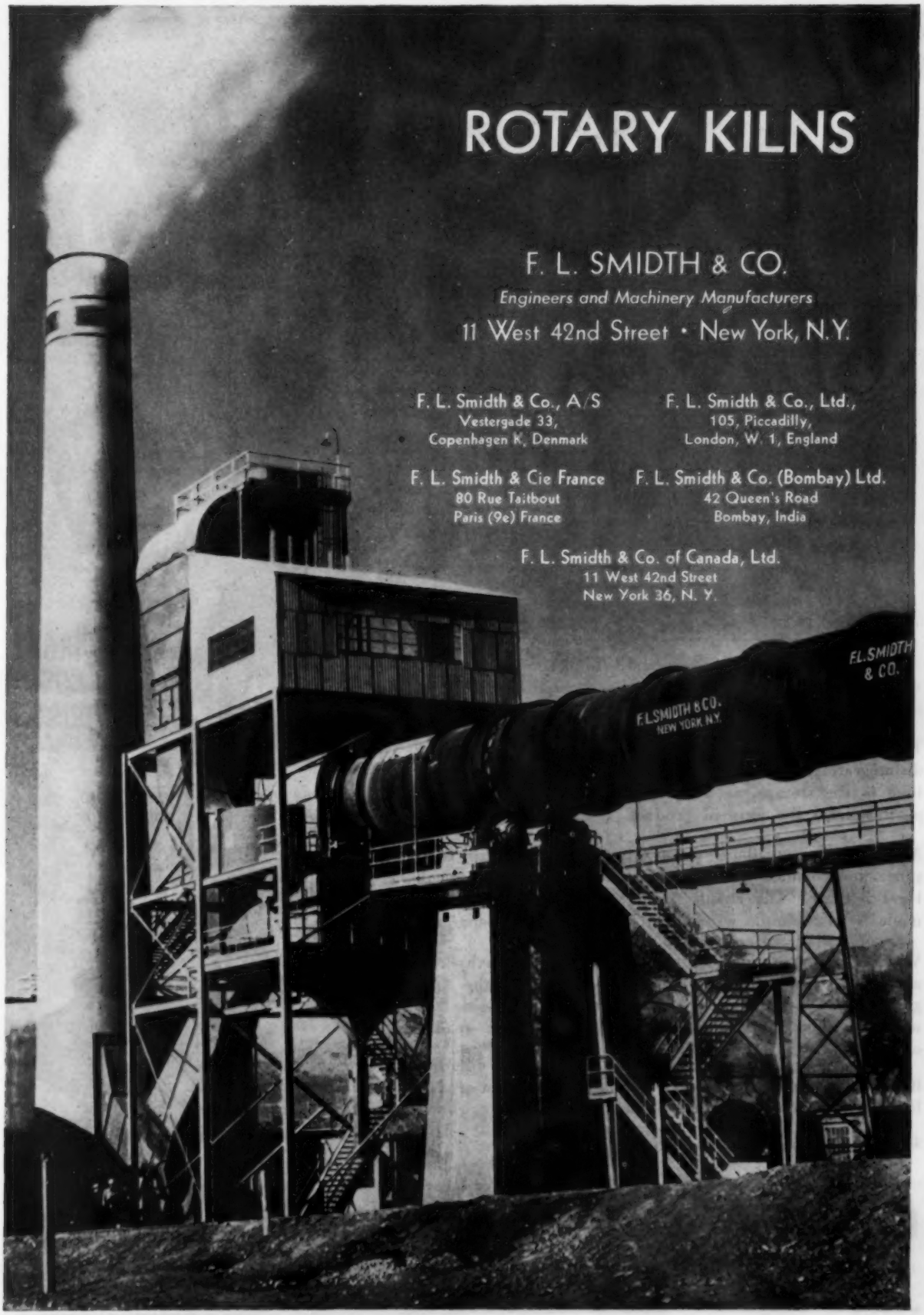
The Taft-Hartley Act provides that unions and management both take part in administering welfare funds covered by collective bargaining agreements. Partly owing to a weakness in the act, however, unions sometimes have assumed the major role in governing these funds, although employers are the chief contributors.

IT now appears that, while the Taft-Hartley Act outlines certain requirements for the establishment of company-union welfare plans, it has proved inadequate. Loopholes in the act have been exposed in that it does not apply to funds set up before the act was passed. Also the terms of the act can be circumvented by non-profit corporations and union-dominated insurance companies. Negotiated "wage increases" transferred to welfare funds have not been covered by the present provisions of the act. Another important consideration is that many of the welfare funds in existence are not Taft-Hartley trusts and, therefore, are not subject to its regulations.

In 1955 at least 44 state legislatures will meet. There have been indications that many will act to control or regulate employee benefit programs. At present many states exempt union-operated insurance companies and employee trusts from the operation of such rules of law where they exist. It is doubtful whether unions would support legislation that would restrict their operation. Also, according to the Chamber, if a particular state enacts legislation that is too restrictive, anyone disliking these restrictions can seek out the state with the least regulation.

Most states now have adequate regulation in their banking and insurance laws. Eleven billion dollars in pension-trust funds and 8.6 billion dollars in pension and welfare fund insurance is at present regulated under state laws. It is estimated that an additional 2.4 billion dollars is in non-regulated pension and welfare fund reserves. The problem is to provide regulation of those funds outside of present law, and to protect the billions of dollars already contributed and the almost 6 billions that will be contributed by employers to employee benefit programs each year.

Walter E. Trauffer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news of the industry

PIT AND QUARRY

New Quarry to Be Opened In Chelan County, Wash. By Northwestern Portland

With the development of a new limerock quarry above Lake Wenatchee, Northwestern Portland Cement Company is bringing a new industry to Chelan County in Washington. The quarry is about 10 miles above the head of Lake Wenatchee, on the Soda Springs Forest service road.

Last fall the company contracted with Goodfellow Brothers of Wenatchee to widen and straighten the Forest Service portion of the highway. A heavy topping of crushed rock was placed on the new roadbed. The entire cost of this improvement was paid by Northwestern.

Concrete foundations were placed last fall for the large crushers which were moved to the location in November, 1953. Larsen Construction Company of Wenatchee has completed the preliminary clearing of a portion of the quarry site, preparatory to the installation of the quarrying and crushing equipment. Concrete foundations for the conveyors will be poured next spring.

The equipment to be installed includes a primary crusher, an impactor for secondary crushing, several conveyor systems, and a stockpile and bunkers for truck loading. A 400-kw. diesel-generator set will provide electricity. The crushed limerock will be trucked to a loading site on the Great Northern Railway, to be taken by rail to Northwestern's cement plant at Grotto, Wash.

When completed, the quarry will include the most modern devices for producing and delivering 1,000 tons of rock daily. About 20 men will be moved from the company's present location for quarry and truck operations. The quarry will be supervised by James Halloran, quarry superintendent. The new limerock quarry has been diamond drilled, and tests show enough cement-quality rock to supply the present plant for over 50 years.

Northwestern Portland Cement has spent over $100,000 for the improvement of the Forest Service road to its properties. The total investment involved in this new project will be approximately $350,000.

Memorial Plaque Erected At Site of First U.S. Talc Mill

Robert H. McCarthy, president of the International Talc Company, Inc., Gouverneur, N.Y., recently dedicated a large bronze plaque memorial to the first talc mill in the United States in ceremonies at the approximate site of the mill.

It was built by the Agalite Fibre Company in 1876 to manufacture into powder the fibrous talc ore taken from a local mine. Capacity of the steam-powered mill was eight tons per day.

Spokane Portland Cement To Boost Ideal's Output To 21,000,000 Bbl. Yearly

Directors of the Spokane Portland Cement Company, Wash., have stated that this firm has accepted an offer of $1,600,000 from the Ideal Cement Company for the assets of the concern. The purchase price is equal to approximately $8 per share on the 200,000 shares outstanding of Spokane Portland Cement. Ideal had recently announced plans to extend its operations into Washington.

Annual productive capacity of the Spokane plant is 650,000 bbl. which will bring Ideal's total yearly output to approximately 21,000,000 bbl. Ideal is operating plants in Oregon, California, Montana, Utah, Colorado, Nebraska, Oklahoma, Arkansas, Texas, Alabama, and now also in Washington.

Coming Events

October 18-22, 1954—Chicago. 42nd National Safety Congress and Exposition. Conrad Hilton, Congress, Morrison, LaSalle, and Palmer House hotels.

October 20-22, 1954—New York. Fall meeting, National Industrial Sand Association. Hotel Plaza.

January 9-13, 1955—Miami. 39th annual convention, National Sand and Gravel Association and 25th annual convention, National Ready Mixed Concrete Association. Miami Municipal Auditorium.

January 10-13, 1955—New Orleans. Annual meeting and exhibit, American Road Builders Assn. Roosevelt Hotel.

January 15-18, 1955—Washington, D.C. Annual convention, National Agricultural Limestone Institute, Inc. Statler Hotel.

January 24-27, 1955—Cleveland. 35th annual convention and exhibit, National Concrete Masonry Association. Cleveland Public Auditorium.

February 7-9, 1955—Cincinnati. 38th annual convention, National Crushed Stone Association. Netherland Plaza Hotel.

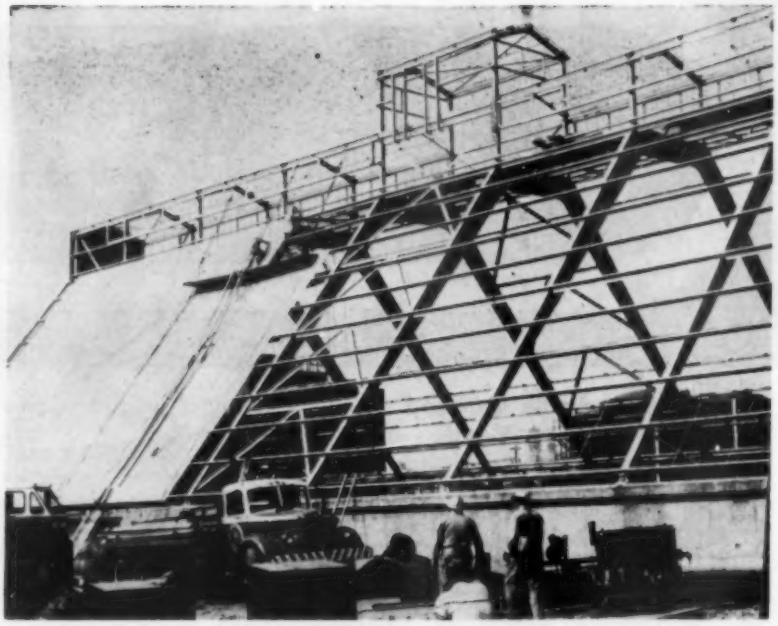
February 21-24, 1955—Milwaukee. 51st annual convention, American Concrete Institute. Hotel Schroeder.

Safe Handling Requisites Dictate Unusual Design For Bulk Storage Building

The basic requirement for safely enclosing and storing 10,000 tons of bulk chemical fertilizer of severe corrosive character and at the same time allowing ready entry and exit for the material, dictated the overall design of the storage building recently erected at Vernon, Calif., for the Filtrol Corporation of Los Angeles.

Since primary need was for covering cone-shaped piles of the material with the minimum of wasted interior space, the straight, high-pitched, inclined roof sides were constructed at an angle slightly greater than the angle of repose of the material to be stored, so that the corrosive chemicals would not be in direct contact with the structural members or interior surfaces. Structural steel, flat-topped "A" frames supporting corrugated Transite roof tile were used for the main members and side walls. All interior surfaces were treated with a corrosion-resistant paint.

All foundation sidewalls are of reinforced concrete, 22 ft. deep, with the floor 16 ft. below the outside grade. These walls are of sufficient thickness to take the small thrust of the structural members supporting the roof and live loads. The end walls of the building are of vertical steel framing members, with tile exterior. The dimensions of the building are 170 ft. long, 70 ft. wide and 60 ft. high.

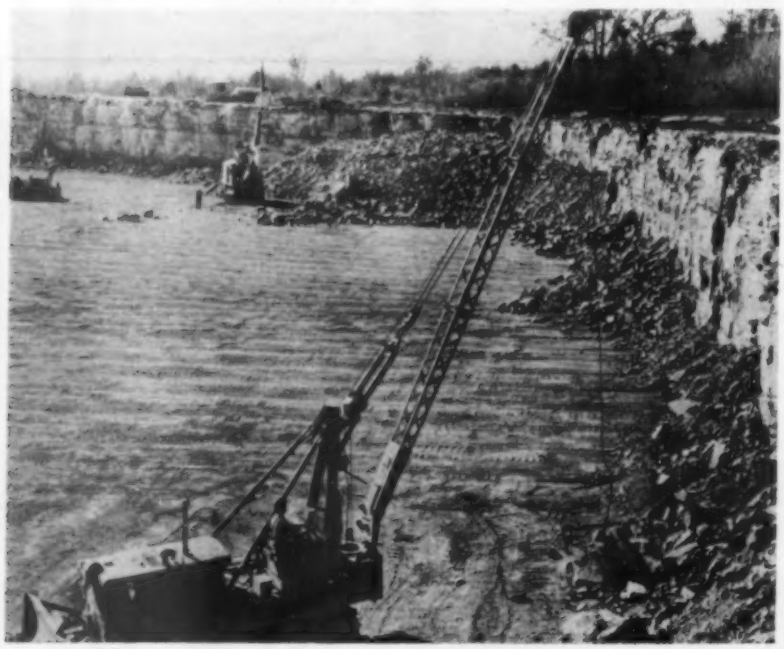


● A series of "structural A's" feature the design of this storage building of the Filtrol Corporation, built to permit handling large quantities of bulk storage of corrosive chemicals in a restricted space.

A monitor section 7 ft. 6 in. high and 12 ft. wide runs the entire length, astride the flat tops of the "A" framing. It is constructed of light structural steel framing and covered with ⅜-in. corrugated Transite roof tile. This monitor houses a 60-ft. long shuttle conveyor belt for feeding material by trip-up discharge from either end to any location for fully controlled storage. This belt receives its material from an adjacent mill *via* another belt conveyor.

For exit of the materials from the building four openings in the storage flood feed the material by gravity to a sub-floor conveyor belt running in a tunnel to an elevator opening at one end of the building. The elevator discharges at the roof to a conveyor belt which takes material to the bagging building nearby. It operates within a 12-ft. by 15-ft. concrete shaft having an additional opening at the floor level through which material can also be loaded into the elevator *via* bulldozer.

Clarence V. Thomas, professional engineer of Pasadena, Calif., was the designer of the building.



● At the Marquette Cement Manufacturing Company's limestone quarry near Martha, Tenn., a Hyster Hystaway crane mounted on a Caterpillar D8 tractor and equipped with a 2,300-lb. ball, is doing secondary breaking. A bulldozer blade at the other end of the tractor is used for clean-up work. The quarry crusher produces 1,600 tons per day of minus 6-in. rock, which is shipped 20 miles by rail to Marquette's plant in Nashville.

Humble Oil and Refining Company has discovered a new sulphur deposit 5 miles off the Louisiana Coast in the Grand Isle area in the Gulf of Mexico. The company has drilled 2 core holes to a depth of 2,500 ft. and discovered a thick layer of sulphur. Eighteen additional holes spaced about 1,000 ft. apart will be drilled by the company to evaluate the discovery.

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He further states, "during the five months it has been in service, it has required no adjusting or servicing except for lubrication, so naturally we are *completely satisfied* with this kind of production and uninterrupted service. Except for the first cost, we wouldn't know the crusher was there. I might say in passing that the three Lippmann conveyors are giving the same kind of trouble-free service."

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LEW **LIPPMANN**

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

Future Contract Awards Set All-Time Records For East, Dodge Reveals

Dodge Reports of contract awards during August for future construction in the 37 states east of the Rockies broke several all-time high records in F. W. Dodge Corporation's 63-year history.

It was the highest August on record; $1,572,865,000, up 11 percent over August, 1953, and down only 14 percent under the total of July, 1954, which set an all-time July record.

It rounded out the highest January-August total in Dodge history; $12,660,949,000, up 14 percent over the first eight months of 1953.

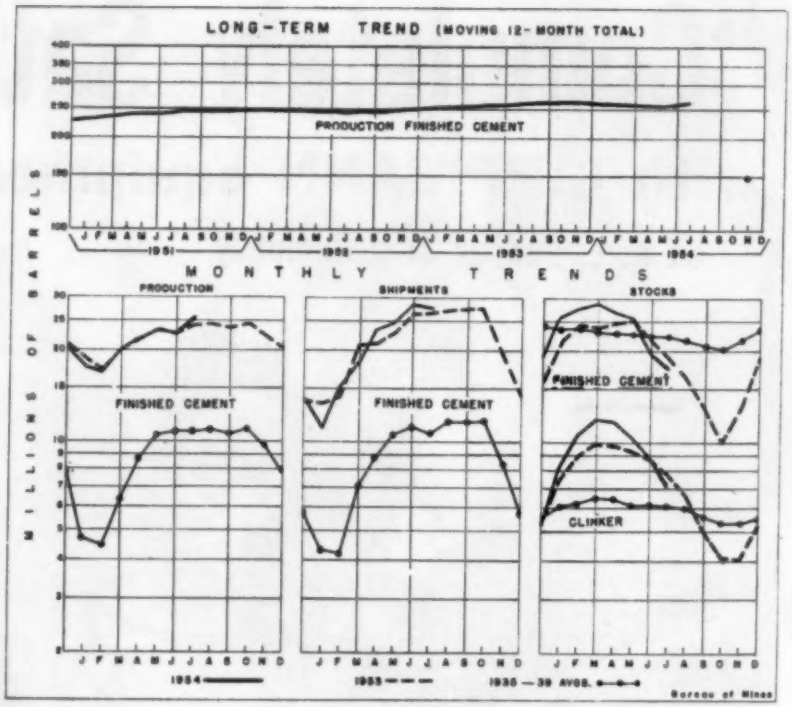
In nonresidential contracts, it set a new high August record; $550,-550,000, up 1 percent over August, 1953; down 14 percent from July. A fair percentage of contracts in this type of construction will be in progress well into 1955.

The August and eight-month totals brought the prospect that at the year's end a new high record for annual volume will have been set; if so, it will be the ninth consecutive year of construction volume gains. The first eight months averaged $1,582,617,000; the remaining four months need average only $1,-195,630,000 to break all annual records.

"The grand total of contract dollars thus far this year has already gained over the corresponding period of last year an amount equal to the 1953 monthly average," it was pointed out by Thomas S. Holden, Dodge's vice-chairman.

Other August classifications were: residential, $692,736,000, down 7 percent from July, but up 36 percent over August, 1953; heavy engineering, $329,579,000, down 27 percent from July and 9 percent below August, 1953.

Individual eight-month totals compared with the like period 1953 were: nonresidential, $4,600,072,-000, up 8 percent; residential, $5,-418,867,000, up 23 percent; heavy engineering, $2,642,010,000, up 9 percent.



SUMMARY — Production of finished portland cement in July, 1954, as reported to the U.S. Bureau of Mines, totaled 25,467,000 barrels — 6 percent more than in the previous July. Mill shipments totaled 27,628,000 barrels — 4 percent more than in July, 1953 — while stocks of 17,448,000 barrels of finished portland cement on hand at the end of the month were 9 percent lower than those on hand July 31, 1953. Clinker production during the month totaled 24,062,000 barrels — 4 percent more than clinker production in July, 1953.

PRODUCTION — One hundred and fifty-seven (157) plants located in 37 states and Puerto Rico reported production of 25,467,000 barrels of finished portland cement during the month, compared to 156 plants, which manufactured 24,134,000 barrels during the month of July, 1953. Clinker production during the month was 24,062,000 barrels, compared to 23,185,000 barrels in July, 1953. Cumulative reports for the first seven months of 1954 show that production was less than one-half percent lower and shipments were 3 percent higher than in the same seven months of 1953.

SHIPMENTS — Mill shipments of finished portland cement totaled 27,628,000 barrels — 4 percent more than in the same month of the preceding year. Shipments were higher in 9 districts and lower in 11 districts compared to shipments in July, 1953. Gains in excess of 12 percent were registered in the eastern Missouri-Minnesota-South Dakota, eastern Pennsylvania-Maryland, Texas, New York-Maine, and Alabama districts. The largest percentage decline was in Kansas, where shipments dropped 16 percent. Other declines in excess of 10 percent occurred in the Puerto Rico and Oregon-Washington districts.

STOCKS — Mill stocks of 17,448,000 barrels of finished portland cement were on hand July 31, 1954 — 9 percent less than at the end of July, 1953 — while stocks of clinker totaled 7,139,000 barrels — also 9 percent less than on the same date a year ago.

"Thelsamort" Is Launched At N.M. Sand-Gravel Plant

Floating of a 35-ton steel barge on an artificial lake was an unusual event recently at a sand and gravel operation in New Mexico. Scene of the launching was the 5-acre pond at the plant of the Sam Sanders Gravel Company north of Portales.

The craft, named the *Thelsamort* for Mr. and Mrs. Sanders and a nephew, is 80 ft. long and 24 ft. wide and draws only 8 in. of water. A dredge will be mounted on the barge for further recovery of material. Production is expected to be stepped up to 100 cu. yd. per hour.

The firm recently was awarded a contract to supply a large amount of gravel for rebuilding runways at the Clovis Air Force base.

Plans for a large expansion of the Bessemer Limestone and Cement Company's cement plant at Walford Station, Pa., were announced recently. A large new cement kiln will be built and more limestone-grinding facilities will be installed.

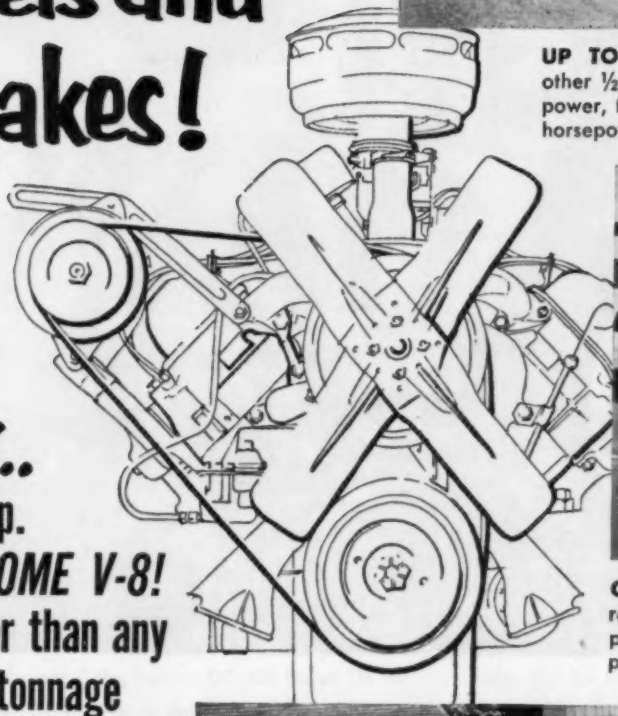
Kaiser Gypsum Co. Plant Dedicated in Seattle

Kaiser Gypsum Company's new multi-million-dollar gypsum plaster mill and wallboard plant in Seattle was officially dedicated by Henry J. Kaiser on September 17.

This Kaiser facility brings a new industry to the Pacific Northwest, the first integrated gypsum products plant in the area and the only one of its kind within 800 miles of Seattle. Initially the plant will need approximately 170 employees, with an annual payroll in excess of $725,-000. The plant was put into production eight months after ground was broken.

World's most powerful pick-ups, panels and stakes!

UP TO 39.4% MORE POWER than other ½-, ¾-, and 1-ton trucks. It's low-cost power, too! Dodge V-8 pick-ups offer most horsepower for your truck dollar.



NOW... new 145-hp. *POWER-DOME V-8!* More power than any other low-tonnage truck engine!

Test for yourself the flashing acceleration, the big power reserve of this new 145-hp. Power-Dome V-8 . . . the ultra-modern truck engine that gives Dodge pick-ups and stakes *more power than any low-tonnage truck!* Ask your dependable Dodge truck dealer to show you a new Power-Dome V-8 or a 110-hp. thrifty six!

OFFERS MORE MILES PER GALLON on regular gas—most hp. per cu. in. displacement of any popular truck engine—prove new Power-Dome V-8's economy.

"NEW-TRUCK" POWER LASTS LONGER: Power-Dome design . . . proved in higher tonnage models . . . means fewer power-stealing "hot spots" in combustion chambers.

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DODGE "Job-Rated" TRUCKS

drive it anywhere

—get faster set-ups, better hole spacing, greater footage, better fragmentation, lower costs

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T286 Self-Propelled Dual Drill Rig

It's 2 Le Roi-CLEVELAND patented air feeds and drills with air-motor booms mounted on a 25-hp tractor

3 speeds forward — 1 speed reverse

USE a Le Roi-CLEVELAND T286 and watch your men go places — go places they couldn't get to before on wagon-drill jobs. The T286 is self-propelled; you can drive it over almost any terrain — and tow the compressor right along behind. Your men can make their set-ups faster — spot holes easier for better fragmentation — without tugging or pushing.

Besides being self-propelled, the T286 drills in any direction — at any angle — uses less air. One Le Roi Airmaster 600 cfm Compressor provides all the low-cost air you need.

Have your nearby Le Roi distributor tell you *all* the reasons why it pays to use the Le Roi-CLEVELAND T286 Self-Propelled Dual Drill Rig. Write for Bulletin RD-21.

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Credit C. B. Seamans of Reedsburg, Wisconsin, with a remarkable invention—a portable lime pulverizing plant which completes the cycle from crusher to storage bin under control of one operator! And credit Cities Service DC-300 Diesel Oil for the remarkable maintenance record of this unique machine. From the beginning, only DC-300 oil was used to lubricate the pulverizer's powerful 275 HP Cummins NHPS-600 Diesel engine. After three years' operation, wear on the connecting rod bearings checked out at .0005". No bearings or rings were replaced, and the engine has now completed its sixth year of service.

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CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

N.S.G.A. Sand-Gravel Survey Results Show 1953 Production, Value

The National Sand and Gravel Association recently announced to all producers of sand and gravel the results of the association's initial effort to fill the need for a current measurement of the annual contribution which the industry makes to the national economy. This survey consisted of statistical questionnaires sent to the 1,710 companies on record as producers. The U. S. Bureau of Mines, in just releasing its 1951 figures on the industry's production, had included in its survey government-and-contractor production and industrial sand production, not included in the N.S.G.A. survey.

Returns were received by N.S.G.A. from 412 companies operating 661 plants; 164 members and 248 non-members. This 24 percent return on the questionnaire represented 63 percent of the member companies and 17 percent of the non-member companies. The reporting companies produced 162,457,463 tons in 1953, valued at $162,663,256, at an average value of $1.00 per ton. The U. S. Bureau of Mines reported a commercial tonnage in 1952 of 285,728,494 tons, excluding industrial sands, so it is apparent that the 24 percent return covered probably 60 percent of the total production and was quite representative.

Other figures of interest include the following: average production per company was 394,314 tons; average production per plant was 245,775 tons; transportation of finished products from the plants, 61 percent by trucks, 28.4 percent by rail, and 10 percent by water. The markets principally served were as follows: heavy construction, 40 percent; the ready-mixed concrete industry, 31 percent; concrete products, 4.4 percent; railroad ballast, 4.2 percent. Almost 14 percent of the total reported output was sold through dealers; the ultimate consumer is therefore not identified for that tonnage.

Based on the returns of the 412 companies reporting, the distribution by size of company showed that the largest number of companies (86) are either in the 50,000- to 100,000-ton bracket, producing 3.7 percent of the total production, or in the 100,000- to 200,000-ton bracket (89 companies), producing 7.8 percent of the total. In the case of 7 companies, each produced more than 3,000,000 tons of sand and gravel last year, or 21.7 percent of the total. The 50 percent of the companies representing the smaller half (*i.e.*, below the median) produced only 10 percent of the total. The 33 companies in the larger brackets (more than 1,000,000 tons) representing only 8 percent of the reporting companies, produced 81,237,985 tons, or 50 percent of the reported sand and gravel production in 1953.

In announcing these results to the membership of the association, Vincent P. Ahearn, N.S.G.A. executive secretary, said that the co-operation of the reporting companies was greatly appreciated. He hoped that future surveys would have a larger participation, as the report, widely circulated, would help develop a better understanding of the economic role which the sand gravel industry plays in the life of the country. He added that in making the survey the association had respected the pledge to make identification of individual reporting companies impossible.

A LIGHTWEIGHT THAT WILL **DIG!**

Page

RL "DIXIEBUCKET"

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Cover Picture....

● This month's cover photo shows a scene at the quarries of Marquette Cement Manufacturing Co., Oglesby, Ill. A Bucyrus-Erie shovel with a 55-ft. boom and 4-cu. yd. bucket is loading overburden into an Athey side-dump trailer hauled by a Caterpillar tractor. Stripping of this composite overburden of earth, cap rock, and shale (up to 120 ft. in depth) to reach the 27-ft. deposit of limestone, and disposal of this waste into the exhausted portions of the quarries in restoring these areas, is featured in the story told of this operation on pages 96 to 104 of this issue.

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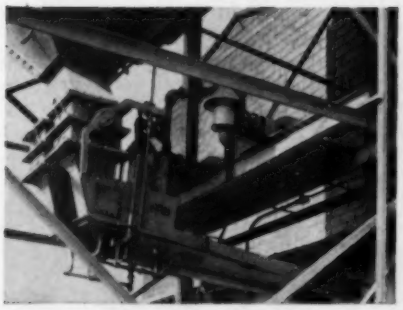

F-H Airslide

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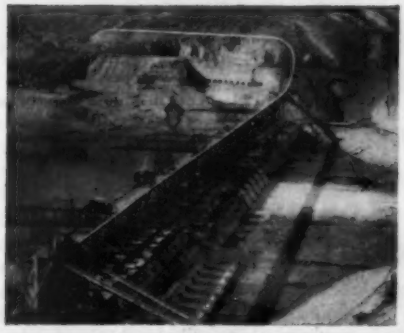
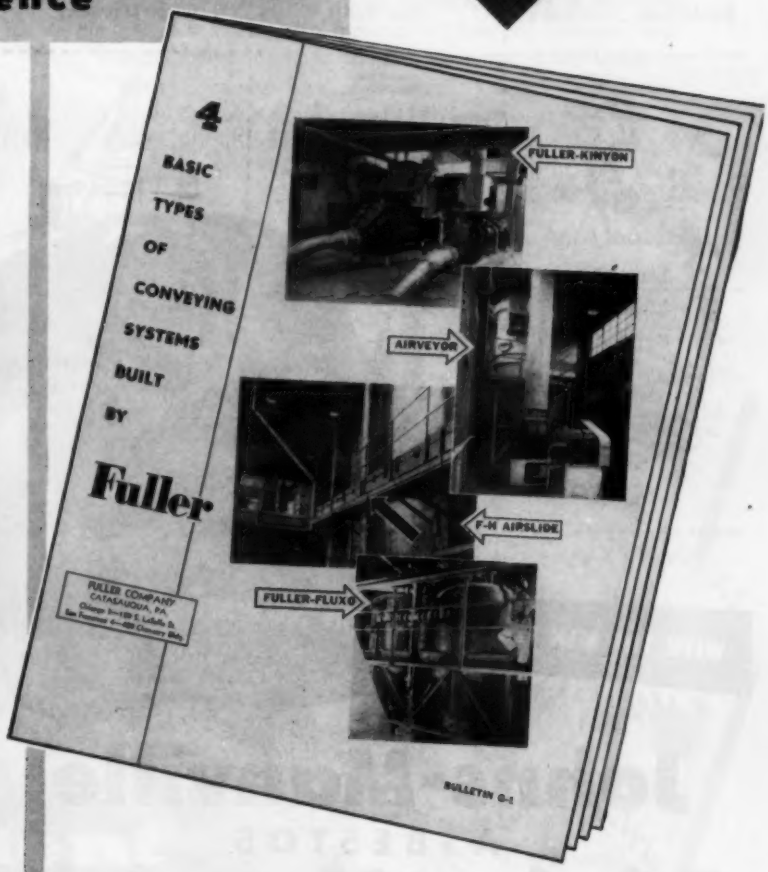


Fuller-Fluxo System



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JOHNS-MANVILLE JM PRODUCTS

Establishing of Fair Prices For Conservation Material Cancelled by New Revision

According to information received from headquarters of the National Agricultural Limestone Institute, Inc., the Department of Agriculture has issued *ACP Memorandum 91*, a revision of regulations governing the fixing of fair prices for conservation materials and services acquired under purchase orders. In this revision existing fair prices were cancelled, as of September 3. (The agricultural Act of 1954 provides that the establishment of fair prices is permissive, rather than mandatory.)

This action means that county committees may issue purchase orders showing only the amount of money which ACP is to pay. The amount the farmer is to pay the vendor for the material is to be left to the discretion of the farmer. There is a further restriction that the amount which ACP will pay the farmer will in no event exceed the cost of the material.

The memorandum requests any committee wishing to continue to establish fair prices to prepare a statement outlining its reasons for so doing and submit it to the ACP office in Washington.

Mine Equipment Company To Process Phosphate Rock

The Mine Equipment Company is constructing a washing plant at Columbia, Tenn., for processing phosphate rock, which is slated to be in operation this year. The new plant will represent an investment of about $200,000. Wayne Pressnell is president of Mine Equipment Co.

Also associated with the new Columbia organization is H. R. Mosley, former manager of the TVA phosphate plant at Columbia. According to Mr. Mosley, the new plant will produce "washed phosphate sand" resulting from special processes of beneficiating low grades of phosphate materials by mixing with higher grades.

The third and last of the kilns scheduled for installation in the new plant of the Missouri Portland Cement Company at Prospect Hill, St. Louis, Mo., has been purchased; this kiln is to be erected in 1955-56. The first two went into production in 1950. When this installation, including companion mills, is completed, the full capacity of this modern plant will be 4,800,000 bbl. annually.

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Bureau of Mines Announces Winners In 1953 Sand and Gravel Safety Contest

Awards for outstanding safety records in 1953 were made by the U.S. Bureau of Mines to 54 of the 165 plants that competed in the fourth annual Sand and Gravel Safety Competition. All winners of awards had injury-free records for the year.

The participating operations were registered in two competing groups according to type of operation—a bank or pit group and a dredge group. Forty-three of the enrolled plants were dredge operations and 122 worked banks or pits.

Overall injury experience for the competition was a frequency rate of 21.9 injuries per 1,000,000 man-hours and a severity rate of 3.4 days lost per 1,000 man-hours of work. An aggregate of 12,300,000 man-hours was worked by all plants. Certificates of Achievement in Safety were awarded to operations at which 20,000 or more injury-free man-hours were worked, and to each employee who worked at the top ranking plant in each group, a Certificate of Accomplishment in Safety was presented as a commendation for his contribution to the safety record of the plant at which he was employed.

Bank or Pit Group—For the second consecutive year, the Eliot Plant No. 104 of Pacific Coast Aggregates, Incorporated, at Pleasanton, Calif., won top honors for the best safety record in the bank or pit group. In 1953 this plant was operated 152,857 man-hours without a lost-time injury. During the four years the Eliot plant No. 104 has participated in the competition, only 10 lost-time injuries have been recorded, all in 1950 and 1951, causing a loss of 286 days during a total worktime of 622,999 man-hours. During this period the injury-frequency rate was 16.05 per 1,000,000 man-hours and the severity rate 0.46 day lost per 1,000 man-hours, each rate being well below the corresponding average rate for 1953 and the rate for the 4-year history of the contest of all competing plants.

The 122 bank or pit operations entered in the 1953 contest were worked almost 9,000,000 man-hours. The injury-frequency rate was 21.79, a new low contest record rate for the group. The severity rate of 2.516 days lost per 1,000 man-hours was almost 2½ times greater than the 1952 rate because of three deaths due to accidents; no one was killed on this type of operation in 1952.

Dredge Group—The Eagle Lake plant of the Texas Construction Material Company at Eagle Lake, Tex., had the best safety record among the 43 dredge operations enrolled in the 1953 competition. A Certificate of Achievement in Safety was awarded this plant for an injury-free record during 129,540 man-hours of work. During the four years the Eagle Lake plant has been enrolled in the Sand and Gravel Competition, its employees have worked 517,790 man-hours with only 7 injuries which caused 128 days of disability. This adds up to a frequency rate of 13.519 injuries per 1,000,000 man-hours and a severity rate of 0.247 day lost per 1,000 man-hours of worktime or exposure to risk, each rate considerably better than the corresponding average rate for the 4-year history of the contest.

The 43 dredge operations entered in the 1953 competition were worked 3,400,000 man-hours. The average participant did not fare too well in preventing accidents. The safety record for the group in 1953 showed an injury-severity rate of 5.629 days lost per 1,000 man-hours or more than half again as high as the rate in 1952 and almost 2½ times the rate for the 4-year period of the contest. The injury-frequency rate of 22.118 per 1,000,000 man-hours while slightly better than the 1952 rate, was higher than the 4-year average rate.

Perfect Safety Records—There were 73 sand and gravel plants that operated through 1953 without a lost-time injury. Men at these plants, of which two were trophy winners, worked 2,901,922 man-hours or 66 percent of the combined worktime of all enrolled plants. Of the 73 injury-free plants, 55 were bank or pit operations and 18 were engaged in dredging. Included in this select group were 19 plants—13 banks and pits and 6 dredges each of which worked less than 20,000 man-hours, the minimum required by the competition rules for consideration in awarding the certificates. Many of these 19 plants have enrolled in each of the four years of the contest, even though they were aware of their ineligibility for receiving awards. These concerns are highly commended for continuing in the contests.

A FAMILY AFFAIR

Mother and father, brother and sister—everybody benefits when everybody gives the UNITED WAY. United Community Campaigns all over the nation appeal to you this month. Give generously to your town's united campaign for voluntary health, recreation, family welfare, and defense related services.

Injury-Free Operations—The following plants, excluding the two trophy winners, had no lost-time injuries during 1953. All injury-free plants with 20,000 or more man-hours of worktime were awarded Certificates of Achievement in Safety.

Marquette wet-pit, Marquette Cement Manufacturing Co., Memphis, Tenn., 142,301 man-hours.

Dredge "Franklin", Warner Co., Tullytown, Pa., 117,095 man-hours.

Roscoe No. 2 dry-bank, Consolidated Rock Products Co., Sun Valley, Calif., 113,862 man-hours.

Quigley wet-pit, Hurst Gravel Co., Hurst, Tex., 98,425 man-hours.

Fair Oaks No. 111 dry-wet pit, Pacific Coast Aggregates, Inc., Fair Oaks, Calif., 91,465 man-hours.

Centerville No. 106 dry-wet pit, Pacific Coast Aggregates, Inc., Centerville, Calif., 90,657 man-hours.

Alleyton wet-pit, Texas Construction Material Co., Alleyton, Tex., 85,950 man-hours.

Herndon Rock Products Nos. 1 & 2 dry-bank pit, Stewart & Nuss, Inc., Herndon, Calif., 74,623 man-hours.

Hollimon wet-pit, Texas Construction Material Co., Eagle Lake, Tex., 71,780 man-hours.

Kerlinger No. 114 dry-pit, Pacific Coast Aggregates, Inc., Tracy, Calif., 68,947 man-hours.

Cayuga dry-bank, Material Service Corp., Cayuga, Ind., 68,577 man-hours.

Nos. 9-10-11 dredge, Lyman-Richey Sand & Gravel Corp., Valley, Nebr., 61,952 man-hours.

Sunland dry-pit, City Rock Co., Sunland, Calif., 59,416 man-hours.

Northport dry-bank, Metropolitan Sand & Gravel Corp., Northport, N. Y., 57,041 man-hours.

Ricks wet-pit, Texas Construction Material Co., Ricks, Tex., 56,240 man-hours.

Nos. 5-6 dredge, Lyman-Richey Sand & Gravel Corp., Plattsmouth, Nebr., 50,734 man-hours.

Greene-Grano dry-pit, J. L. Shiely Co., Grano, N. Dak., 50,290 man-hours.

No. 7 dredge, Lyman-Richey Sand &

(Continued on page 46.)

SMALL QUARRIES AND MINES IMPROVE THEIR PROFIT PICTURE WITH "EUCS"

fewer drivers . . . lower fuel cost . . . reduced maintenance

When your competitors are using "Eucs" to haul stone, sand or gravel, you've really got a problem on your hands! You just can't afford to pass up the cost cutting advantages . . . the high production and low maintenance cost . . . that you get with "Eucs".

And your operation doesn't have to be a big tonnage producer for "Eucs" to pay off. For example, H & R Stone Co. of Indiana is just one of many small quarries, sand and gravel producers, and open pit mines that have cut their hauling costs with Model UD 10-ton Rear Dumps. This quarry replaced four conventional highway trucks with a single 10-ton "Euc" and reports savings of $6000 per year in maintenance cost alone. Because the "Euc" stays on the job with none of the lost time that was a costly headache previously, there have been important savings in labor cost, too.

Have your nearby Euclid Distributor provide a production and cost estimate for your operation . . . there's no obligation and the chances are mighty good that he can show the way to better profits through lower hauling costs.

10-ton off-highway "Euc"

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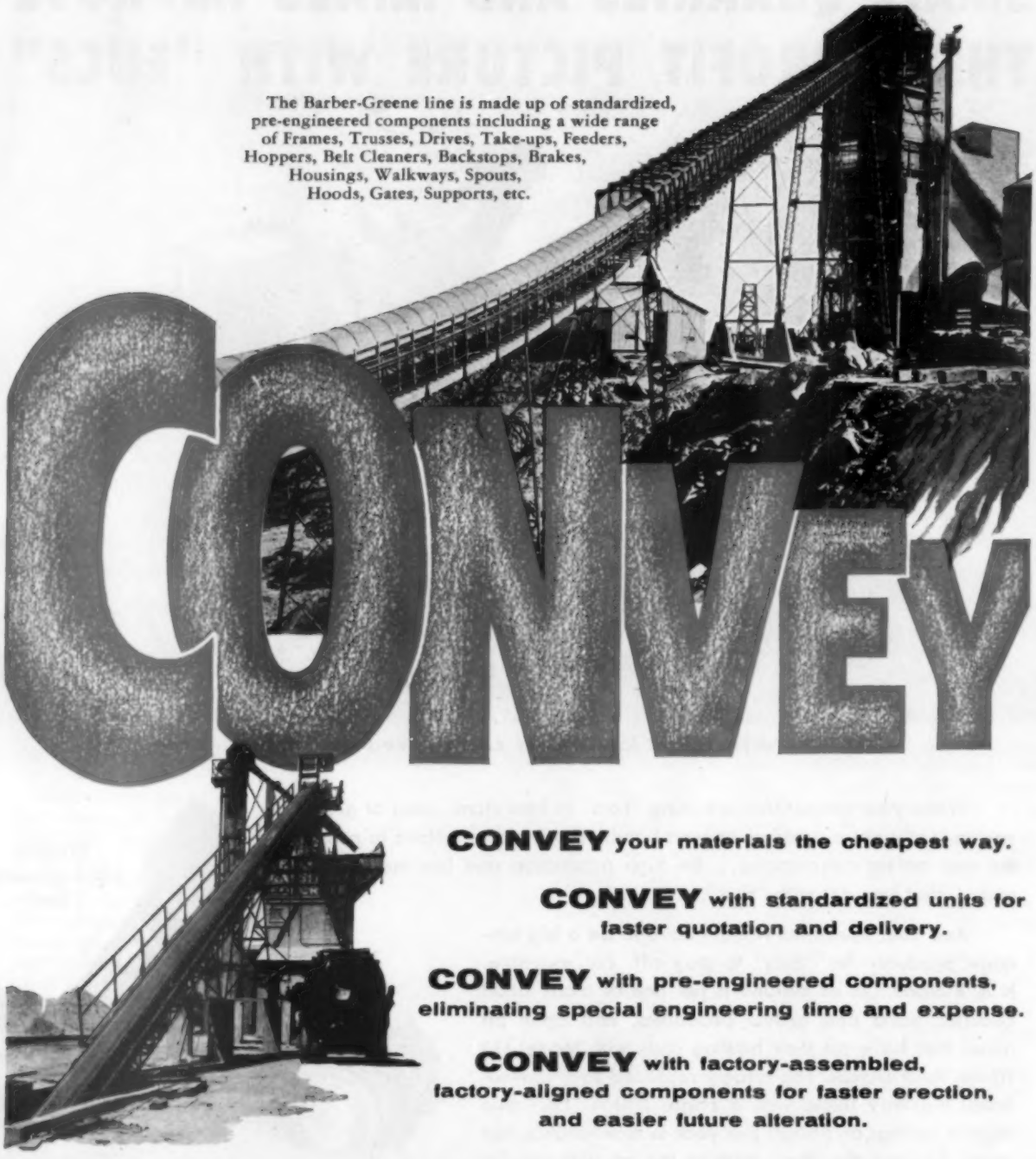

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SAVE ON POWER Uniform bed of material passing over grating requires only low pressure air. Comparatively smaller fan and motor uses only about ½ hp-hr per barrel of clinker. Fewer auxiliaries to drive.

SAVE ON MAINTENANCE Simplified design and small number of parts require little attention. Low upkeep cost. Lubrication is required only on drive mechanism. Only four grease fittings. Horizontal grate system insures smooth flowing bed of material and high efficiency cooling throughout. There is little or no wear on grates or grate warpage. Maintenance is only about 1/10 cent per barrel of clinker.

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ALLIS-CHALMERS

● An interesting quarry loading scene at the Catskill Mountain Stone Corporation quarry at Hudson, N.Y., showing a Bay City Model 45 ¾ cu. yd. shovel loading a 4-wheeler dump truck. Note that the truck body has been extended in order to give a greater pay load. The shovel, which supplies the 80-100 t.p.h. operation with quarry-run stone, is powered by a Waukesha gasoline engine; it has a 19-ft. boom and a 14-ft. dipper stick.

Note that the limestone strata are slightly arched. Geologists refer to this type of structure as a shallow anticline.

Big High-Purity Deposit To Furnish Silica Sand For New Minnesota Plant

At Ottawa, Minn., the $300,000 plant of the Silica Sand Corporation is scheduled to go into production this fall to process material from what is described as a deposit of remarkable purity.

Silica Sand, organized in February, 1953, plans to turn out its product at the rate of 500 tons (ten carloads) per day. However, it is anticipated that the plant will later be expanded into a $500,000 project with a capacity of 20 carloads per day.

Although the deposit had been known for at least 30 years, the purity of the sand (testing 99.8 to 99.85) was discovered only recently. According to R. A. Hendrickson, president of the firm, it was found that the deposit is 100 to 118 ft. deep and will provide "unlimited reserves". The sand, which lies beneath an overburden of 3 to 14 ft., will be mined by the hydraulic method. It has been indicated that the company expects the oil industry to be its largest consumer at the outset of production.

Located on the main line of the Chicago St. Paul Minneapolis & Omaha Ry., the plant will also have the advantage of a supply of natural gas in close proximity. In addition to Mr. Hendrickson, the firm is headed by E. B. Maurer, secretary-treasurer, and A. W. Florine, vice-president.

Expanded Clay & Shale Assn. Holds Mid-Year Meeting

The mid-year meeting of The Expanded Clay and Shale Association was held at the Fort Shelby Hotel in Detroit on August 10 and 11. This organization was formed in January, 1954, with the following officers: Glenn C. Barnes, Onondaga Brick Corp., president; A. Starling Johnson, Carolina Tuff-Lite Corp., vice-president; Lucas E. Pfeiffenberger, Alton Brick Co., secretary; R. Neil Christy, Marietta Concrete Corp., treasurer; and R. A. Utiger, Cinder Concrete Products, publicity chairman.

Reports of the committees at the meeting showed a gratifying record for the year in terms of work done and accomplishments achieved. Two important reports related to the marketing of good, graded aggregate and to the many tests that are being carried out by the underwriters, universities and private laboratories.

The association members were guests of Elroy Bobolts and Melvin Cruzen on an inspection trip through the Light Weight Aggregate Corporation's plant at Plymouth, Mich.

May, 5-Month Lime Sales Indicate Declining Trend

As shown in the accompanying chart, May, 1954, domestic sales of open-market lime (622,884 short tons) decreased one percent from the previous month (629,868 short tons), according to reports by producers to the U.S. Bureau of Mines. Total sales for May, 1953, were 710,874 short tons. A parallel decline was seen in the January-May period, which showed sales of 3,025,521 tons this year and 3,565,838 in 1953.

Refractory, chemical, and other industrial uses increased over the previous month, whereas decreases were noted for agricultural and building uses.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1953-54, by Types and Major Uses (Short Tons)

	April	May		January-May	
	1954	1954	1953	1954	1953
By types:					
Quicklime	449,471	465,233	538,775	2,777,680	2,254,289
Hydrated lime	180,397	157,651	172,099	788,158	771,232
Total lime[2]	629,868	622,884	710,874	3,565,838	3,025,521
By uses:					
Agricultural:					
Quicklime	10,629	7,367	9,796	29,658	37,218
Hydrated lime	34,821	19,388	23,589	102,060	104,180
Total	45,450	26,755	33,385	131,718	141,398
Building:					
Quicklime	16,254	15,753	16,443	79,630	75,766
Hydrated lime	85,210	79,732	81,929	372,017	372,015
Total	101,464	95,485	98,372	451,647	447,781
Chemical and other industrial:					
Quicklime	278,531	295,753	318,542	1,690,539	1,423,726
Hydrated lime	60,366	58,531	66,581	314,081	295,037
Total	338,897	354,284	385,123	2,004,620	1,718,763
Refractory (dead-burned dolomite)	144,057	146,360	193,994	977,853	717,579

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high-calcium and 40 percent high-magnesium.

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Five billion pounds of fish yearly. It's a catch that would make the oldtime Gloucester fisherman gasp—yet it's all in the day's work for America's modern fishing industry. And it's a job that couldn't be handled without the aid of *muscles of steel*—indispensable wire rope.

Whether off the Newfoundland Banks, along the Gulf Coast, or in the waters of the Pacific, powerful winch-equipped trawlers depend on Wickwire Rope to haul in their heavily laden nets.

On landlubber assignments, too, Wickwire Rope has a vital role in helping American industry do a better and more efficient job. In the oil fields and the logging camps. In the mines and the quarries. On construction and highway projects. In numerous and varied materials handling operations. On all of these jobs, Wickwire Rope consistently demonstrates its ability to deliver performance that is unrivalled for long-lasting economy and reliability.

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LIKE MANY OPERATORS of heavy duty gasoline and diesel engines Deer Park Pine Industry, Inc., Deer Park, Washington, has found it *pays* to use Shell Rotella Oil:

- One of the company's trucks has gone 80,000 logging miles using Shell Rotella Oil and the engine head has never been removed.
- One D-7 Caterpillar was torn down for the first time after 9,000 hours of operation . . . cylinder walls showed only the slightest taper. Because of this, the oil change period has been extended from 40 hours to 80 hours.
- One P. & H. loader has run for *ten years* with only two major overhauls.

Here are the reasons Shell Rotella Oil has been adopted as the crankcase lubricant by hundreds of heavy duty equipment operators from coast to coast.

1. Superior anti-wear protection
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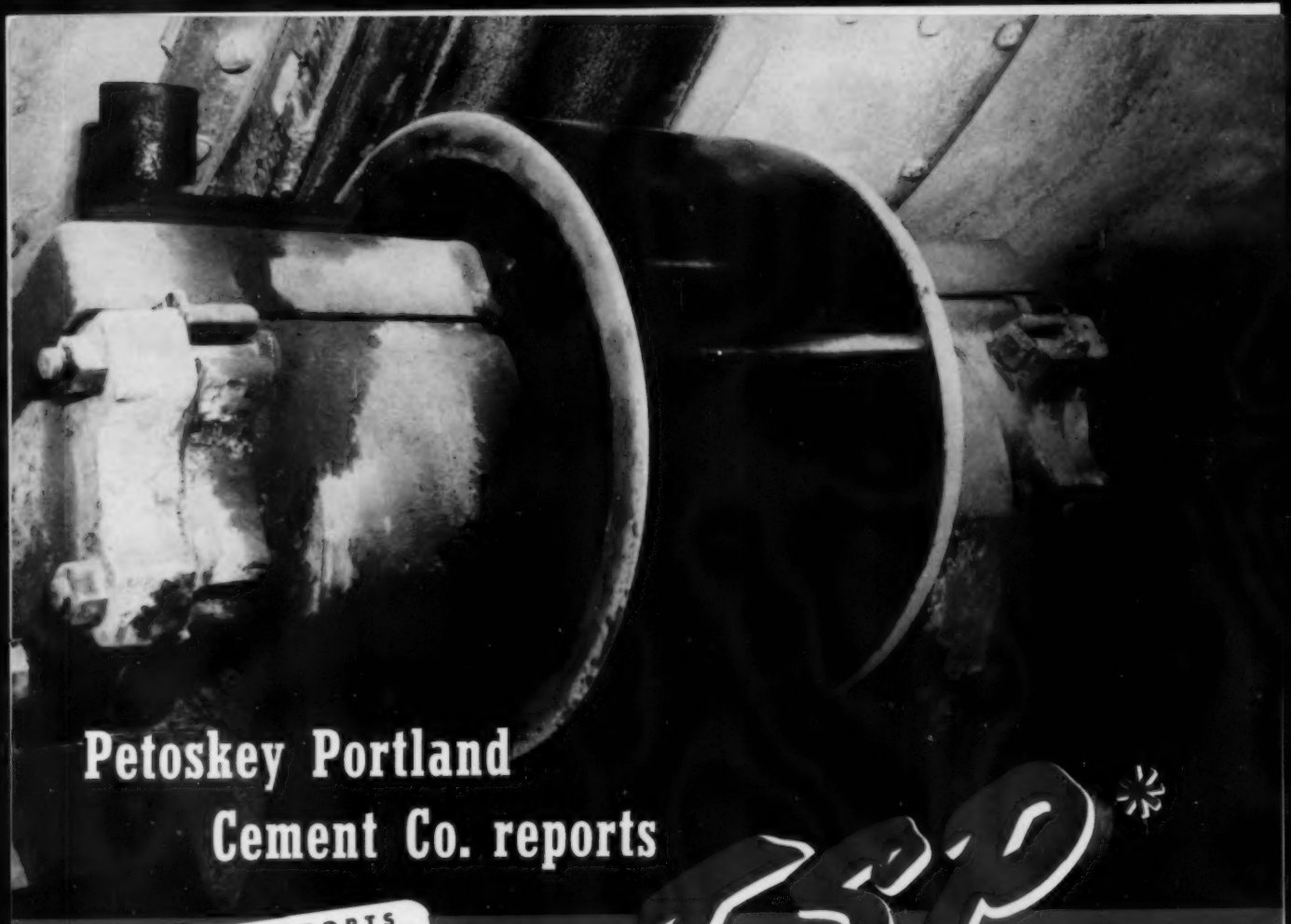

Petoskey Portland Cement Co. reports

TSP trunnions outlast them all!

INDUSTRY REPORTS

Excerpt from letter, Petoskey Portland Cement Co.,

"...on our #1 kiln we ran one (TSP Trunnion) 7 years and one 8 years before replacing bearing...on # 2 kiln we ran one 12 years and one 11 years...on #3 kiln, 6 years, 7 years and 8 years...on #4 kiln, 10 years and 8 years...also good results with both TSP rolls and shafts..."

Petoskey Portland began installing "Tool Steel Process" Trunnions in 1940, completed installation on all 4 kilns by 1943. None has worn out to date. Eighteen TSP Trunnions are now in use. In addition to their long service life, they have been instrumental in smoothing the surface of the large tires.

TSP Shafts installed with these TSP Trunnions are showing the same phenomenal results. Prior to the installation of TSP Shafts, bearings had to be renewed every 2 years.

Next time you need replacement parts, specify "Tool Steel Process" parts. Savings in material, man hours and downtime will prove to you TSP superiority, as it has to hundreds of companies.

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...the products that carry an absolutely positive GUARANTEE to give a longer life in the same service than any other product.

THE TOOL STEEL GEAR AND PINION CO.

CINCINNATI 15, OHIO, U. S. A.

AD 69

THE STANDARD OF QUALITY SINCE 1909 FOR GEARS • PINIONS • ROLLS • WHEELS AND OTHER HARDENED PRODUCTS

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

WITH the October 1, 1924, issue PIT AND QUARRY went on a semi-monthly basis. It was explained that the amount of advertising had increased steadily until it was becoming too thick for pocket size. Rather than enlarge the dimensions, it was decided to publish the magazine more often, beginning with that issue, No. 1 of Volume 9. That this was also a good business move was evident from the fact that the two October issues carried considerably more advertising than the single September issue, and that many advertisers appeared in both issues.

The October 1 issue contained a wide variety of information of interest to producers. Covered were such subjects as *Developing a Quarry, Rock Dust in Coal Mines, The Care and Repair of Motor Vehicles, The Limitations of Anti-Trust Laws, Waterproofing Concrete and Cement, The Effect of Lime on Distillation of Coal,* and the second installment of a series on *Cost Accounting in the Crushed Stone Industry* by D. J. Hutchinson.

Because of its tremendous size and importance to the nation the huge Muscle Shoals development on the Tennessee River was described. This project was begun in 1918 by the government to manufacture nitrates for munitions in time of war and fertilizer in peace time. Included was a complete description of the plant, which mixed the 1,291,385 cu. yd. of concrete for the dam, spillway, and locks, and details on mix design, including the addition of lime.

Plant operating articles in that issue included a complete description of the new sand and gravel plant of the Cedar Grove Sand & Gravel Company at Cedar Grove, N. J. This compact and efficient operation was designed and equipped by Telsmith. Also described were three new crushed stone plants which had been built by the Southern Pacific Railroad to supply ballast for its lines. One plant was located near Lucin, Utah, another near Palisade, Nev., and the third near Santa Margarita, California. The Lucin and Palisade plants were regarded as probably the largest and most modern plants west of the Mississippi River. Each was designed to produce 10 carloads per hour, and had a bin capacity of 90 cars.

There was a complete description of the expansion program of the Birmingham, Ala., plant of the Lehigh Portland Cement Company, built late in 1923, with a capacity of 3,900 bbl. daily. A fourth kiln was soon found necessary; and this, with other additions, increased the capacity to 5,000 bbl. Another story featured the Garland Sand & Block Company of Youngstown, Ohio. This firm operated a 250-cu.-yd.-per-day gravel plant which supplied its own concrete block and tile business as well as the local demand. The new wall plaster plant of the Crescent Wall Plastering Company, Inc., at New Orleans, La., was also described.

The October 15 issue also contained a wide variety of articles. Subjects covered included *Principles of Group Insurance on Life and Health, Oil Engines in the Pit and Quarry Industries, Is Your Blasting Effective?, Comparative Tests of Slag With Sand and Gravel, The Evaluation of Speed Reducing Equipment, The Effects of Lime on Shale Retorting,* and Part III of the series of articles on *Cost Accounting in the Crushed Stone Industry.*

One of the features of that issue was an article by F. W. O'Neil, chief engineer of the Ingersoll-Rand Company on L. O. X. — the accepted abbreviation for liquid-oxygen explosives. Mr. O'Neil gave the history of this new product and described its action and its applicability to the quarrying industry. He also described and illustrated several shots, including one at the Calcite Quarry Company, Myerstown, Pa., which was the first of its kind on a commercial scale ever made in a quarry in the United States. One of the plant operating articles in that issue described the new sand and gravel and concrete block plants of the Acme Concrete Products & Gravel Company at Cement City, Mich. These plants were designed and built under the supervision of E. W. Dienhart, general manager, who had joined the company after six years of responsible work with the Portland Cement Association. The Bakstad Machinery Company, headed by J. R. Bakstad, supplied the equipment. These plants produced 1,000 tons of gravel and 6,000 concrete units daily.

Other plants described included the new 3,500-ton-per-day crushed stone plant of the Anna Stone Company at Anna, Ill.; the interesting plant of the Maryland Glass Sand Company at Round Top, Md.; and the new 2,000-ton-per-day sand and gravel plant of A. W. Robertson, Ltd., near Belleville, Ontario, Can.

There was also a complete description of probably the only cement plant in this country ever operated by prison labor. In December, 1923, the State of Michigan took a 5-year lease on the plant of the Michigan Portland Cement Company at Chelsea, Mich., with an option to purchase. Retained were the superintendent and 30 key employees who supervised the 160 convicts working there. None of the cement produced was sold commercially.

International Cement Corp. Planning Canadian Plant

British Columbia is slated to have a second cement plant in the near future, but it will be a venture of American interests—the International Cement Corporation, a subsidiary of C. F. McDougall Associates of Dallas, Tex.

International will build the facilities at Chilliwack on the Trans-Canada highway. Production is scheduled to begin in May, 1955. Exploration of the deposit which will furnish the raw material revealed that reserves were available for full-scale production "for many years".

At present the only cement plant in the province is that of the British Columbia Cement Company at Bamberton on Vancouver Island.

Del Monte Properties Company of Pebble Beach, Calif., had a yearly net income for 1953 amounting to $552,980, or $4.68 a share on gross revenues of $3,187,496. In 1952 the net income totaled $253,681, or $2.11 a share on gross revenues of $2,759,518.

W. R. Bendy, cement engineers, recently announced that they have moved to their new quarters at 6326 Bartmer Ave., St. Louis 14, Mo.

Permanente Cement Co. Delivers Millionth Barrel From Alaskan Operations

The millionth barrel of cement was delivered in Alaska during the month of August from Permanente Cement Company's Anchorage distribution plant, W. A. Marsh, vice-president and general manager, announced recently.

Permanente opened the 30,000 bbl. capacity Anchorage plant on July 14, 1950, bringing bulk cement to Alaska for the first time. The introduction of this efficient method of cement delivery has opened a new era in concrete construction throughout the rail belt area of Alaska.

Before the advent of Permanente's bulk delivery facilities, all cement entering the Territory was sold in sacks. The high cost of handling sack shipments—loading and unloading ships, warehousing, delivery to job sites—and also unavoidable losses from spillage added a heavy premium to the delivered price of cement.

At the Anchorage plant bulk cement is blown from ship or barge holds directly into shoreside silos with pneumatic cargo-handling machinery, then transferred to delivery trucks by gravity-feed hoppers. This system has resulted in lowering the delivered price of cement in Alaska by 40 percent and encouraging the installation of a number of privately-owned concrete batch plants in the Anchorage-Fairbanks area.

Owens-Ill. New Ione Sand Deposit of High Quality

Owens-Illinois Glass Co., Chicago, in announcing recently that a new sand plant will be built at Ione, Calif., with completion scheduled for the end of the year, emphasized the particularly high quality of the brilliant white silica sand found at the site.

According to H. S. Wade, general manager of the company's Pacific Coast division, the deposits contain 40 per cent clay and 60 percent of the purest kind of silica sand, one of the basic raw materials used in the manufacture of glass. The plant site, in historic California's gold rush country, is about 30 miles northeast of Stockton. Water, which is essential in large volume for the processing of sand, is brought into Ione from the town of Sutter's Creek in a canal originally built by Chinese labor. Owens will immediately build processing mills, office, and storage space on the area, where a small pilot plant had earlier been constructed.

● This abandoned slate quarry near Wind Gap, Pa., has been fitted with a floating "roof" of steel pontoons (each weighing nearly three tons) and will be used as a storage reservoir for heating oil by the Esso Standard Oil Company. Conversion of the 56,000-sq. ft. pit, which has a maximum depth of 225 ft., will permit storage of 42 000 000 gal. of oil. The project was completed after more than a year at a cost of $500,000. The oil, brought from Linden, N.J., via pipeline, will float on water pumped in from an adjacent quarry. Facilities for delivering both oil and water to the reservoir may be seen at the right.

International Minerals & Chemical Corp., Chicago, Ill., has acquired Sonsel Refractories Corp., Brighton, Mich., producers of zirconium refractories. Louis Ware, president of International, said there would be no changes in plant management.

persistent hoarseness or cough

...is one of the seven commonest danger signals that *may* mean cancer...but should *always* mean a visit to your doctor.

The other six danger signals are —Any sore that does not heal ...A lump or thickening in the breast or elsewhere...Unusual bleeding or discharge...Any change in a wart or mole... Persistent indigestion or difficulty in swallowing...Any change in normal bowel habits.

For other facts about cancer that may some day save your life, phone the American Cancer Society office nearest you, or write to "Cancer"—in care of your local Post Office.

American Cancer Society

International Cement Congress Recently Held in Belgium

The first International Congress of Manufactured Cement was held in Brussels last summer under the sponsorship of the Belgian Cementmakers Syndicate, the European Productivity Organization, and the Belgian Office for Productivity Development. The aim of the congress was to co-ordinate research and to exchange information on all technical phases of cement-making.

Belgian, French, Dutch, Finnish, Swedish and American industry officials presented papers on various phases of the cement industry. There were also conducted tours of various Belgian cement plants. G. E. Olson, Builders Supply Corporation, Phoenix, Ariz., discussed phases of American cement manufacturing.

Oregon Chemical Lime Firm To Build Three-Kiln Plant

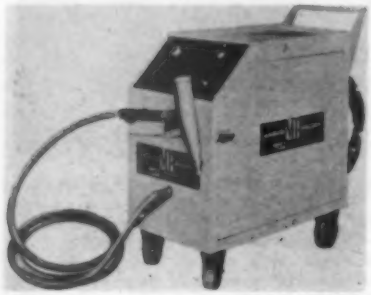
The Chemical Lime Company, Baker, Oreg., which will build a new plant near Baker, plans to have three rotary kilns as part of its equipment for processing high-calcium lime.

Purchase of a 220-acre site at a different location will cut off approximately three miles of hauling distance from the quarrying operation to the plant, since the trucks will not pass through the city, as originally planned.

Putnam-Hawley Building Materials, Inc., of Potsdam, N. Y., broke ground for a new 1,000 to 1,500-ton-per-day sand and gravel washing and crushing plant near West Parishville, N. Y.

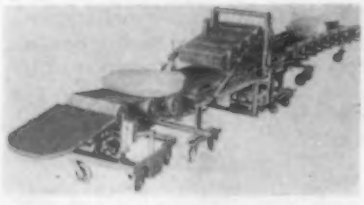
New Machinery and Equipment

(For more information, use card on p. 99)



● The advantages of both hand and automatic welding are combined for the first time, and drawbacks of both eliminated, in Amsco's new MF Welder. A spool of bare electrode wire feeds continuously through a hand-held hopper of magnetic flux enabling the welder to work for long periods with no electrode change and to maintain visual control over the job. Used on a variety of metals, the technique gives good deposition, minimizes craters and cuts electrode stub loss. The MF hooks up with conventional machines and is easily mastered by unskilled operators. **(51)**

● As resistant as polyethylene to acids and alkalis, but less expensive, Poly-Kote multiwall bag material developed by Arkell & Smiths is coated with polyethylene and wax to stop moisture pickup. A month humidity test (90% at 100 deg.) had calcium chloride caking and staining the alphalt-laminated bag (left) but not affecting Poly-Kote (right). **(52)**

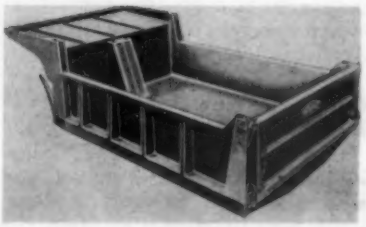


● Furnished in any length, Flexoveyor's new box car and truck unloader with bag-flattening attachment is powered by a 1½-hp gearmotor, runs 120 fpm, delivers 1000 bags an hour. The discharge end lifts and lowers hydraulically. **(53)**

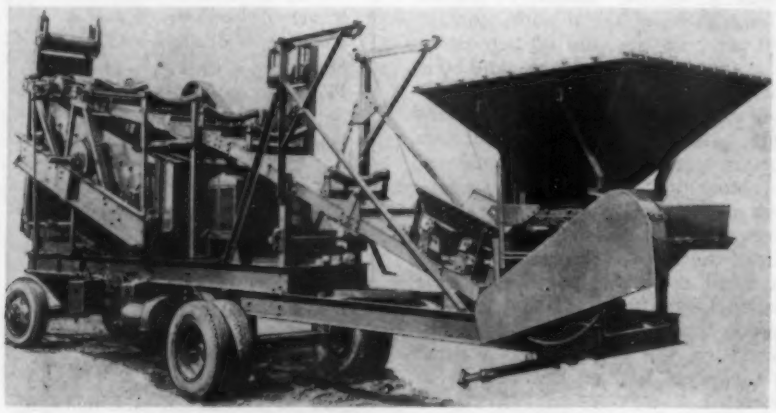
● A new concept of filling and weighing material in multiwall paper valve bags is utilized in the new St. Regis Fluopacker filling machine. The machine features "fluidization" for clean operation, bag-size saving, weight accuracy, low maintenance and versatile production. **(54)**

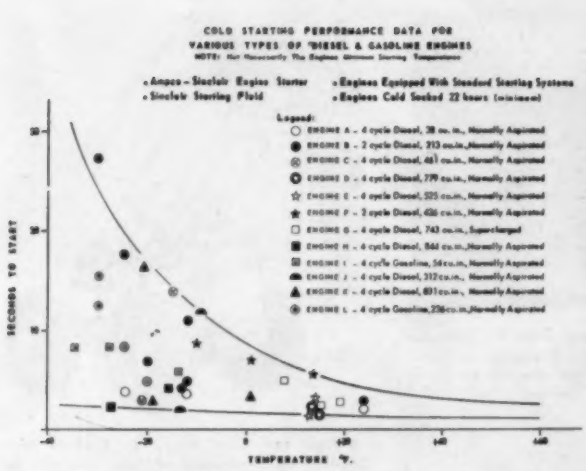
● Two-pin installation permits removal in less than 10 minutes of new tractor loaders built by Shawnee. Featuring double-acting cylinders and an over-size hydraulic system, the loaders are built in two sizes—the Loadmaster for the larger Fordson Major Diesel type tractors, and the Special for smaller ones. **(56)**

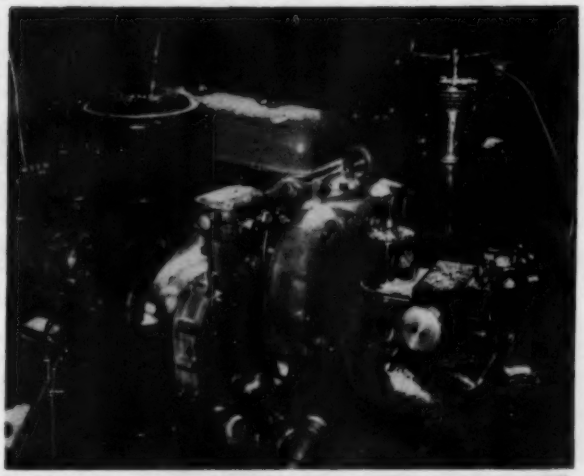
● Select exactly the right dump body for the job, urges Hercules Steel Products, introducing a new contractor line with rugged duty, all-purpose, standard and solid steel platform body types for 60, 72, 84 and 102-in. cab-to-axle trucks. Underbody and telescopic hoists are available, as are load-carrier cab shields for over-the-cab loading. **(55)**



● Called "ideal" for roadside work where bins are unnecessary, a new lightweight, portable screening and loading plant, the 310, has been introduced by Pioneer for the production of screened sand and gravel on small or large jobs where moves are frequent and little auxiliary equipment is necessary. The output reaches 50-75 cu. yd. per hour on sand. It needs 25 hp (continuous), has a 16-ft. wheelbase, 43¼-ft. operating length, weighs about 20,000 lb., has a 6-ft. shovel hopper. **(57)**

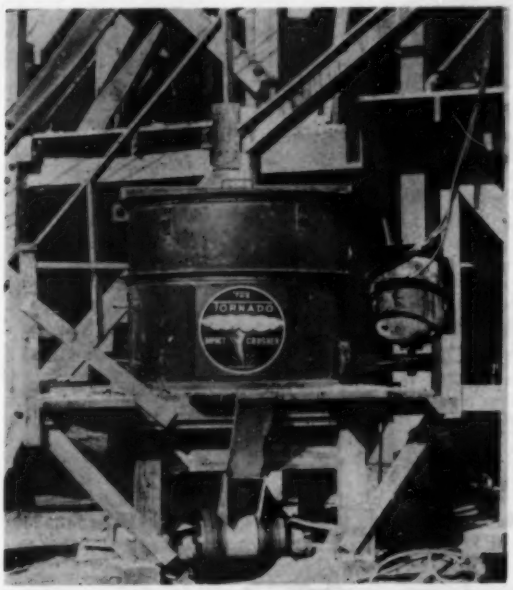



COLD STARTING PERFORMANCE DATA FOR
VARIOUS TYPES OF DIESEL & GASOLINE ENGINES
• Ampco – Sinclair Engine Starter
• Sinclair Starting Fluid
• Engines Equipped With Standard Starting Systems
• Engines Cold Soaked 22 hours (minimum)
Legend:
SECONDS TO START
TEMPERATURE °F.



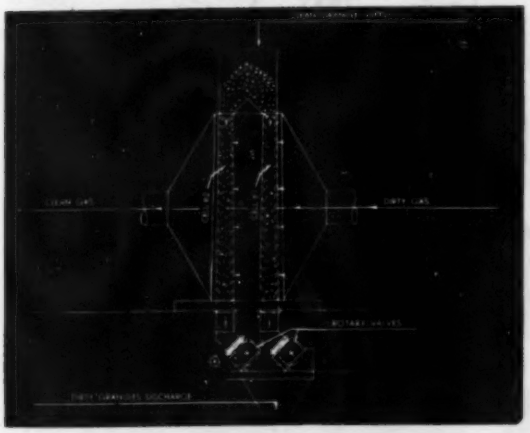
● A real boon for engine users is promised by the Ampco-Sinclair engine starter, developed jointly by Sinclair Refining Co. and Automotive & Marine Products Corp. The new fluid applicator is the first such device for diesel and gasoline starting to automatically meter the proper amount of starting fluid to the engine. It gives positive starts at temperatures as low as —40F, prevents harmful detonations, and provides a diminishing starting fluid/air flow rate after starting to maintain combustion. The automatic injection of the proper amount of fuel to start any engine at any temperature allows even the most inexperienced operator to start an engine successfully.

A 10-oz. can of fluid, which is inserted sealed, is good for 60 starts at an average cost under 5c each. Controls on the starting device are made large so as to be manipulated easily with gloved hands. In the photograph, one of the new starters is mounted on an ice-covered test engine in a cold storage room where starting was done at —40F. The chart gives performance data on 12 engines of different displacements at various temperatures from +40F to —40F. In all cases positive starts were obtained between 2 and 27 seconds with the new starter. (58)



● Top quality cubical products are said to be produced by the Tornado impact crusher just introduced for the reduction of small gravels, stone, ores, etc. Featuring a "square" impact blow, the crusher has only one moving part, a vertical shaft driven by a 1800 rpm motor. Light in weight, self contained, it is easy to install, needs little headroom, has negligible vibration, does no attritional grinding. Single bolts hold reversible manganese impact plates. Hook-on impeller shoes are made of highly resistant ferrous-chromium. The Tornado has no hammers, grates, gears, zinc, babbit, cooling water, circulating oil, gyrating or reciprocating motions. (59)

● A paper sling fitted with paper tubes combines with bayonet-type pallet forks to provide a new and revolutionary form of palletizing for handling bagged products. Devised by American Cyanamid Co., the Accopak pallet weighs less than three pounds. It permits the double-decking of palletized loads without wooden pallets. (61)



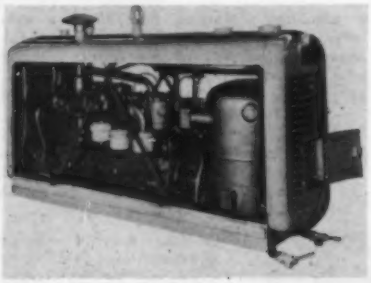
● A unique principle is used in the recently-developed Dorfan Impingo Filter for controlling fumes, dust and smoke. The device, introduced by Mechanical Industries, uses a moving granule principle rather than conventional cloth bags or water sprays. Gases pass horizontally through cells containing moving granules. Solids in the gas impinge on and adhere to the granules, thus cleaning the gas. Any number of cells can be used, in parallel or series. A variety of granular materials are used, depending upon the type of filtering. (60)

● A small new power shovel for handling loose bulk materials in close quarters, the Bulk Loader, developed by Clark Equipment Co. to handle 1200 lb. loads (11 cu. ft.), has an outside turning radius of only 73 in.; loads, lifts and dumps in seconds; has a 60 deg. dumping agle; will climb a 14 percent grade fully loaded. (62)

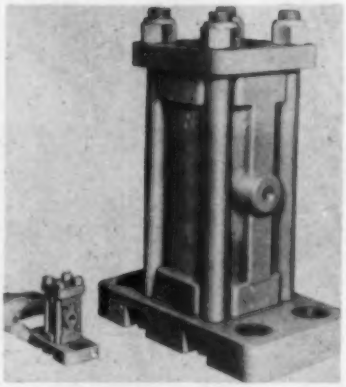
● Mounted on its own gooseneck trailer frame, Standard Steel's new Twin 92 portable cyclone dust collector serves 3,000, 4,000 or 5,000 lb. asphalt plants. Designed to meet all known state highway clearances, it uses standard truck tires, has either electric or diesel drive, a large exhaust fan, dust return screw and fan stack with louvre damper. (63)

● Built for rough duty, this 4-wheel drive loader by Tractomotive has one-yd. capacity, rear wheel power steering, a clutch-type transmission with 4 speeds in each direction, and a torque converter drive. Clearance under the bucket lip at dumping is 8-ft. (64)

● Valve bags are filled tightly to uniform weight without pre-weighing with Coddington's new multiple-action Auger-matic bag packer. A shaker in the scale jolts each bag vigorously and repeatedly during the filling. The valve bag stays clamped in place on the spout regardless of the force of the material flow. The machine shuts itself off when the proper weight is reached and loss of material is prevented. (65)



● The 105 cfm Utility compressor is back in the Le Roi line after several years. Using the same basic engine as Le Roi's portable, it is built up under one housing including an upright air receiver to conserve space and make it ideal for mounting behind a truck cab. It is 82-in. long, 25 wide. (66)

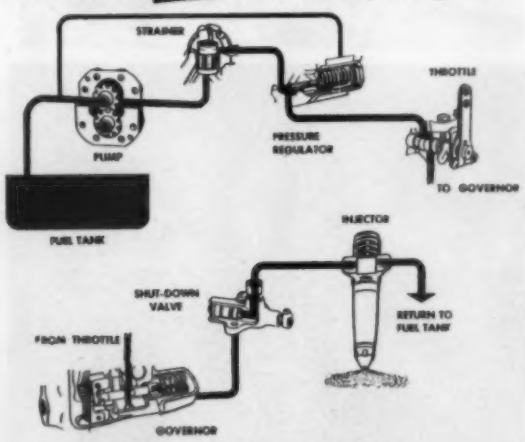


● Mutt and Jeff of the bin vibrators! Cleveland has added these units (1 and 5-in. piston diameters) to its Type F air vibrators for bins, hoppers, chutes, etc. These two and six in-between sizes operate on 25 to 100 psi continuous line pressure. (67)

● Speed reducers for vertical or near-vertical mounting are being made in a new Shaft-King line by American Pulley, with ratios of 13:1 and 20:1 for requirements to 42-hp. An overload release is also available. (68)

● Diesel fuel injection is made as simple as gasoline engine carburetion with this "revolutionary" fuel system developed by Cummins Engine Co. Called the "PT system" it simplifies servicing and cuts maintenance and overhaul costs. A fixed metering orifice with a variable fuel oil pressure behind it is the key to the system. "PT" can be applied to all Cummins engines built since 1932, and is standard equipment on new models. (69)

schematic PT fuel flow diagram



This diagram shows pressure regulator, throttle and governor in full horsepower operating positions

MICHIGAN *bucket control means "Bigger Loads . . . . . FASTER"*

Watch a MICHIGAN Tractor Shovel at work —with particular attention to bucket action —and you'll *see* how a MICHIGAN* will *handle bigger loads, move more yardage*—faster, at considerably lower cost.

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Check these outstanding Quality Features of MICHIGAN* Tractor Shovels . . .

1. **Superior Bucket Action**—bigger loads, faster loading
2. **Clark Power-Shift Transmission**—faster operating cycle gets more yardage
3. **Clark Torque Converter**—3-to-1 torque multiplication; power when needed—no conventional clutch
4. **Clark Planetary Axle**—relieves torque load on shafts and gears, prolongs machine life
5. **Power Steering**—much easier handling, lessens driver fatigue
6. **Gas or Diesel**—right power for the job; more horsepower than any comparable machine

Six models: capacities from 1.5 cubic feet to 2¼ cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

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168

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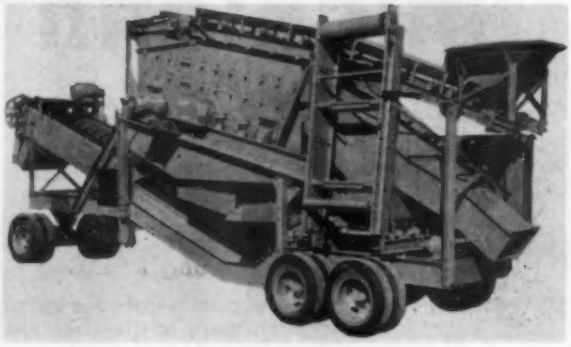
● There are no clutches in Trojan's new Loadster. Drive is direct through a torque converter coupling. It handles ¾-yd. (struck), has four work speeds and a high speed for travel, reverse or forward. It loads over the drive wheels so that the weight adds to the traction. **(70)**

● Designed for tandem axle chassis and 5- to 7-yd. bodies with 12¼-ton peak payloads, Galion Allsteel's new 11-ft. dump body 12N-5 has high tensile or high resistant steel construction and a 14-in. body pivot. Light in weight, the 7-yd. size is only 3,350 lb. with hoist. **(72)**

● The pulling power of a crawler tractor is combined with the speed and flexibility of a wheeled unit through the use of Garrett All-Drive, a 4-wheel drive for the conversion of the International TD-6. The machine is in the 30 drawbar hp class, weighs 13,060 lb. with winch, dozer and canopy, and hits 8 mph on roads. Four-fifths of the assembly is standard International parts. **(71)**

● Said to be the mightiest concentration of power per cubic inch in its weight and class, Ford's new 172 cu. in. 4-cylinder industrial engine develops 61 bhp at 2800 rpm and should cut gas consumption considerably **(74)**

● Four sizes of finished aggregate can be washed at a 150-200 tph rate by Universal's new Washmaster. The all-electric pushbutton controlled job combines a 4x12-ft. 3-deck inclined gyrating screen fitted with spray bars and piping with a 25-ft. double screw fine material washer (22-in. dia.). **(73)**



● Winter's a-coming! Completely hydraulic operation features the one-man Baughman Spreadmobile for ice control materials. Convenient controls in the cab gives the driver accurate control over both the width and the amount of the spread. Separate hydraulic motors operate the feed and the distributor. Material is spread in front of both the front and rear wheels, in widths ranging from 1½ to 40-ft. A split bottom dump is standard equipment and can be used as a general dump body off-season. A special exhaust chamber, running the length of the body, uses the heat of the motor to keep the spread material from freezing. A heavy-duty 14-hp Wisconsin engine, with all controls inside the cab, drives the entire speed mechanism. **(76)**

● Extremely compact motor control centers that save as much as 50% floor space have been developed by General Electric. Nine NEMA Size One starter units of the fusible or circuit-breaker types or six Size-Two will fit the 90-in. trough without reduction in pull-box space. **(75)**

Technical Considerations In Natural Pozzolan Production

Part I

another P and Q exclusive

DO we have today the technical and practice-proven basis for the establishment of a "new" lime-reactive-materials industry? It is the writer's firm conviction from observations and review, and especially from his own research and engineering activity in testing, activating, and producing pozzolans in the past several years, that such a basis exists today in fact, and that it will be increasingly recognized.

By WOLF G. BAUER
Consulting Engineer

The modern laboratory is esthetically as well as functionally designed.

The "technical philosophy" of an industry can be expressed only by the rational enthusiam and vision toward product application of those who have labored to obtain factual scientific data on raw materials, process, and product. A pozzolan industry-in-the-making will justify its existence and the double-barreled sales approach of "better concrete at lower cost" only through a solid research backgrown on the part of each individual producer member. Seldom has nature provided such a complex series of primary and metamorphosed substances to be processed by one industry under one dangerously singular name as the word "pozzolan" signifies. And yet these complex and still little understood pozzolanic subtances have enjoyed a long and respectable history in the service of man, both ancient and modern. With a closer re-examination of their chemical as well as cementing properties in the light of modern cement technology, these lime-reactive substances are and will be finding a growing, diversified, and specialized market in the building industry.

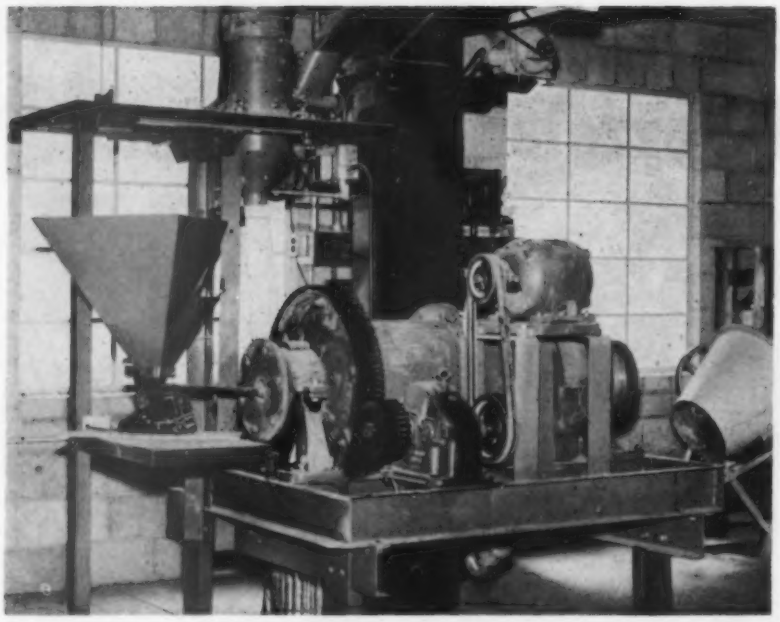
What Are Pozzolans? Prior to 1845 natural and activated pozzolans, together with limestone or calcareous shales and clays, constituted the primary raw materials for the manufacture of cements. It was not until that date that mixtures of lime and clay were burned together to partial fusion, and the first portland-type cement came on the market in England, even though prior to that time (in 1824) Aspdin had patented an underfired clay-lime cement which he called "portland cement" for its resemblance to the natural Portland stone in use at that time.

Pozzolans, like portland cement, also derived their name from that of an associated locality, in this case Pozzuoli in Italy, where a consolidated volcanic ash or tuff was employed as a cementing material with lime by the Roman engineers for remarkably resistant seawater concrete construction. Other volcanic materials of this type were used in Italy, Spain, France, and in Germany for hydraulic cement use with lime, until eventually all materials exhibiting this property were called pozzuolana. While portland cement replaced most of these pozzolanic or hydraulic lime cements because of its faster setting and better strength properties at an early age, as well as its more uniform and predictable setting characteristics, certain other qualities of these earlier pozzolan cements have come under investigation in the last half-century, and their use in modern concrete design is increasing, on the strength of these newly-appraised properties.

We might then define pozzolans as siliceous and aluminous substances which chemically react with lime in solution or in colloidal state to form cementitious crystals and gels. Since the present use of pozzolans goes beyond the cementing properties related to lime reaction, this definition may not be entirely adequate. Where the pozzolanic material contains or forms compounds which have the property of adsorbing (and thus neutralizing) within their lattice structure certain injurious alkalies released by either portland cement or aggregate, the definition should include this important property of many pozzolans. An active silica or silicate thus distinguished is one which either has not reached its final stable crystalline form, one which is more soluable, or one which is strained or unbalanced by loss of OH and H ions, resulting in greater reactivity toward other ions in solution.

The mechanism of pozzolanic reactions during and after the setting of portland cements in mortar and concrete is as yet little understood. However, it is significant that aside from the various advantages gained by the use of pozzolans, such as increased workability, plasticity, watertightness, decreased aggregate segregation, lower heat of hydration, and lower-cost concrete, the development of strength is different from, and also independent of, the mechanism which produces resistance to sulphates, or which inhibits alkali-aggregate interaction leading to concrete volume changes. On the one hand, soluble amorphous silica and silicic acid combines chemically with calcium hydroxide in solution* to form insoluble cementitious calcium silicates and gels and colloids. On the other hand, certain aluminates and silicates such as clay minerals, opal, and zeolites have the additional ability to adsorb alkali ions in solution to form gels with like power, or to act as base-exchange media, in each case removing cement or aggregate-released sodium and potassium ions which might other-

*It is not certain whether solution is always involved.



Pozzolan and masonry cement production is controlled, and processing is tested with pilot-scale manufacturing equipment before and after plants are designed and put into operation. This setup served in a research program and later for product development and control.

wise react with active silica in the aggregate to form gel layers that occupy greater volumes and thus crack the mass after setting. It is obvious, therefore, that we deal either with a calcium-reactive, or with a calcium plus sodium-potassium reactive pozzolan. Since all pozzolans must be calcium-reactive in order to develop a certain amount of cementing strength which will allow their use in sufficient replacement quantity to bring about any or all of the various afore-mentioned advantages, it may be sufficient at this time to classify pozzolans as low, medium, and high strength, as well as low, medium, and high alkali-reactive pozzolans, assigning minimum strength and reactive values to these designations.

Field For Pozzolans For many years up to the present, pozzolans and portland-pozzolan cements have been employed extensively in massive dams, irrigation and hydraulic works, seawater piers and structures, LW-concrete ships, tunnels, concrete highways, and certain masonry cements, as well as in oil well and other grouting cements. In Europe pozzolans are added, for various reasons, as cement replacements in numerous types of private, commercial, and public concrete work. In Mexico today 15 percent of all cement used in concrete of all types is pozzolanic cement. In the future concrete masonry products, masonry mortars, concrete pipe, autoclaved products, lightweight concretes, etc., should prove a steadily increasing market. Pressure-cured concrete products are especially benefitted by pozzolanic additions and cement replacements because of the stepped-up speed of the normally slower-acting cementitious silica.

GROUPING OF POZZOLANS

A general classification of materials which possess pozzolanic activity, or in which it can be induced, has been made by R. C. Mielenz of the U.S. Bureau of Reclamation. He groups pozzolans under four headings: (1) volcanic tuffs, (2) siliceous sedimentary rocks, (3) activated clays and shales, and (4) industrial by-products. In this discussion we shall focus our attention primarily on the properties of those materials which must be activated, and in particular the more abundant and widely distributed shales and clays.

A mineralogical classification of the lime-reactive substances directly responsible for pozzolanic activity within the above-mentioned groups of pozzolans has been made by the Reclamation Bureau according to their activity type from a petrographic standpoint. To the general reader these mineralogical designations probably mean little, yet they are significant to the minerals processing and ceramic engineer. Since the pozzolanic activity under each of the first three of the above-mentioned groups may be caused by several types of minerals or constituent substances, present identifiable basic types have been listed in the accompanying table, along with other pertinent evaluations.

Group I The pozzolans in this group are the volcanic glasses. They stem from liquid magmas chilled too rapidly to crystallize, and thus their atomic structure represents irregularly aligned oxygen-silicon networks in which alkali atoms are held at random.

A rhyolite volcanic glass, for example, such as one represented by most pumicites, is chemically similar to that of a granite except that mineralization to feldspar, quartz, mica, etc., was prevented by fast cooling Thus the obsidians, perlites, and pumices are the high-silica or acidic glasses, with an average index of refraction of 1.492 to 1.497. They represent also the more active glasses. Intermediate are the dacite, trachite, and andesite glasses, with indexes from 1.511 to 1.512. The basic or low-silica series are the basalts and scoria of 1.506 to 1.620 indexes, often lowest in the scale of reactivity. However, it should always be kept in mind that these materials and rocks occur quite often in mixtures and also in partially altered form, in which case their pozzolanic activity will vary widely and significantly. There are also a few of these which may be altered by heating to develop higher reactivity. On the whole the volcanic glasses are actually least affected by heating; they are low to medium strength and low to medium in alkali reactivity.

Group II Materials in this group comprise the hydrous and amorphous silica mineral designated as opal. This mineral may occur as the dense, stony form of chert, or as the filling siliceous binder in shales, the porous residue called tripoli, or the precipitated silica of diatom skeletons. Pure opal contains from 3 percent to 13 percent water, but is generally found together with clay minerals in most opaline pozzolans. The range of its reactivity may be influenced by these minerals associated with it.

The opaline pozzolans are strongly affected by heat treatment, and while they vary from low to high in strength, they are invariably high in alkali reactivity. Since the diatomites are extremely porous and require considerable water to reach plastic workability, the amounts of allowable additions or replacements for cement in concrete are restricted on

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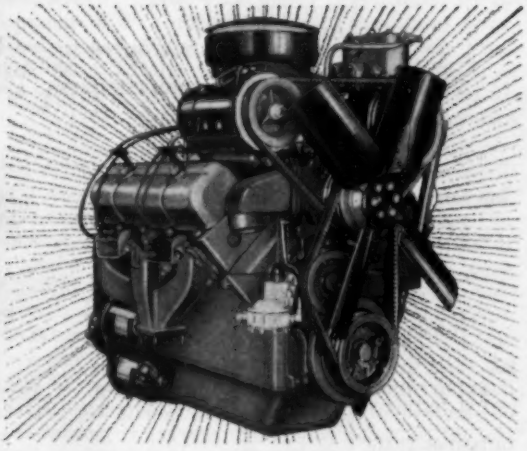

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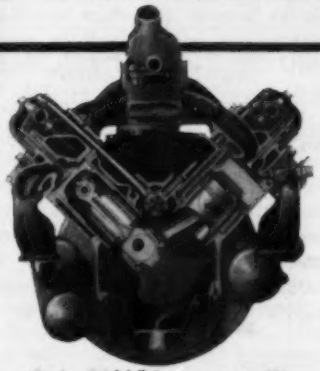

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No truck engine anywhere can compare with the new REO V-8 for long-term profit-potential. Outstanding stamina helps the new REO V-8 deliver highest ton-mile profits ever known in heavy trucking.

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The REO V-8 is not a souped-up version of an old, outdated power plant. It's *all new*, from fan to flywheel! Output? A startling ½ h.p. per cu. in. of displacement—more than 25% higher than the next nearest engine; 35% more than the average of all engines of 360 cu. ins. and larger. It's the world's most modern truck engine.

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TABLE SHOWING SOME GROUP EVALUATIONS OF POZZOLANS*

	GROUP I	GROUP II		GROUP III			
GROUP NAME	VOLCANIC ERUPTIVES	SILICEOUS SEDIMENTS		SHALES & CLAYS			
TYPICAL ROCKS	RHYOLITE & DACITE-PUMICITES, TUFFS, (TRASS) SCORIA, SANFORIN EARTH ALTERED ASHES	DIATOMITE, DIATOMACEOUS CLAYS AND SHALES, OPALINE CHERTS & SHALES TRIPOLI		SHALES & CLAYS WITH MANY ASSOCIATED ROCK CONSTITUENTS DERIVED FROM ALTERED VOLCANICS, SEDIMENTS & IGNEOUS ROCKS, ALTERATION BY HYDROTHERMAL REACTIONS OR WEATHERING, LEACHING, ETC.			
PREDOMINANT ACTIVE CONSTITUENT	RHYOLITE GLASS 65-80% SiO_2, + H_2O, Al_2O_3, Ma_2O, K_2O	OPAL IN DIATOMITE $SiO_2 \cdot nH_2O$	OPAL IN SHALE $SiO_2 \cdot nH2O$	(CLAYS) KAOLINITES $Al_2O_2SiO_2H_2O$	(BENTONITES) MONTMORILLONITES $Al_2O_3 \cdot 4SiO_2 \cdot H_2O$	(HYDRO-MICAS) ILLITES VARIABLE HYDROUS SILICATE	(ALTERED GLASS) ZEOLITES $Ha_2Al_2(SiO_2)_4 \cdot 2H_2O$
ASSOCIATED FORMS	ANDESITE GLASS, DACITE GLASS, BASALT GLASS	(May contain trace of Alumina)	BETA CRISTOBALITE	ANAUXITE HALLOYSITE DICKITE	HECTORITE BEIDELLITE MONTRONITE	VERMICULITE MUSCOVITE	ANALCITE PTILOLITE CLINOPTILOLITE
EFFECT OF CALCINING	USUALLY SMALL	IMPROVED GENERALLY	IMPROVED MARKEDLY	IMPROVED CONSIDERABLY			
OPTIMUM TEMP. FOR STRENGTH	BELOW 1600°F.	1400°-1800°F.	1400°-1600°F.	1200°F.	1400°F.	+1800°F.	1400°F.
OPTIMUM TEMP. FOR ALKALI ACTIVITY	1800°F. PLUS	1400°F.	1400°F.	1400°F.	1400°F.	+1800°F.	1600°F.
COMPARISON TO NORMAL CONCRETE: COMPR. STRENGTH 1-12 MONTHS	BELOW TO ABOVE	ABOVE	BELOW TO ABOVE	BELOW TO ABOVE	BELOW TO ABOVE	BELOW TO ABOVE	BELOW
COMPARISON TO NORMAL CONCRETE: REDUCTION IN ALKALI EXPANS.	INSUFFICIENT TO GOOD	Excellent but used within limits	Excellent	Good	Good, flow in EXCHANGEABLE SODA	Fair	Poor
COMPARISON TO NORMAL CONCRETE: SULPHATE RESISTANCE	MODERATE INCREASE	HIGH	HIGH	VARIABLE			
COMPARISON TO NORMAL CONCRETE: DRYING SHRINKAGE	X 1.3	CONSIDERABLE	X 1.5	X 1.2			
COMPARISON TO NORMAL CONCRETE: SHRINKAGE WITH AIR ENTR. AGENT	NORMAL	In small amounts near normal	NORMAL	NORMAL OR REDUCED			
REL. GRINDING COST	HIGH	LOW	MEDIUM	MEDIUM			
REL. ACTIVATING COST	NONE	MEDIUM TO HIGH	MEDIUM	LOW TO MED.	MEDIUM	HIGH	MEDIUM

*Most of data condensed from U.S. Bureau of Reclamation Study Reports. See Appended Reading References.

account of the resulting high drying shrinkage. These limiting amounts may then not be sufficient to control alkali-aggregate reaction unless they are specially processed, as discussed later. Activated opaline shales, on the other hand, are to be considered as among the most efficient in this respect.

Group III Pozzolan materials in this group are derived from a variety of complex minerals, mostly alteration products of igneous and volcanic rocks. All of these have more or less loosely adsorbed and chemically attached water molecules, as well as structural OH and H ions in their lattices; and they are often mixed and associated with each other in various proportions as shales and clays.

In clay technology we usually distinguish between three primary families of clay minerals, *i.e.* the kaolinites, the montmorillonites or bentonites, and the illite type or hydromicas. Since a clay pozzolan is generally in the form of an original aggregate of minerals, these original crystal substances are completely or partially destroyed, or their lattices are altered in spacing and arrangement, and thus the processed pozzolan is and has become an extremely complex substance, indeed—one which contains first naturally-altered and then artifically-altered components.

Most shales and clays contain several clay minerals of any one or all of these three types, and the predominant may then classify the pozzolan. Often the higher alumina series also represent the more active ones. Under optimum conditions of processing, most of these clay pozzolans will show relatively small reductions in concrete strengths up to 30 percent replacement values. The zeolites probably contribute least to strength. The writer has tested some activated clays and shales which produced increased compressive strength in the 15 percent to 20 percent replacement mixes. All of them, when processed correctly, will tend to reduce alkali expansion, although

somewhat larger quantities are required than when high-opaline shales are used. Montmorillonite minerals high in soda are not suitable in this respect as the alkali-exchange ability of such bentonites will allow calcium to be exchanged for sodium released into the solution, and thus increase such alkali concentration, rather than reduce it. Kaolinite-type minerals seem to be able to neutralize alkali concentration in concretes more effectively than the other higher silica minerals, and they have shown reductions fully the equal of that obtained with opal.

Group IV Pozzolans in this group include the siliceous metallurgical slags, and fly ashes available from large powdered coal-burning furnaces. These materials vary greatly in composition and properties, and have been treated in a number of published papers.

EVALUATION OF POZZOLANS

Pozzolanic materials are not only complex in their compositions, but also in their mechanics of reaction. This complexity is, of course, partly due to our present limitations in analytical techniques and understanding of the nature of the adsorption reactions of ions in solution, ionic preferential bonds in the presence of interfering or catalytic neighboring ions, and in fact the whole field of gels, partially oriented or loosely aggregated crystals, solid to solid direct interactions, and so-called solid solutions and glasses. Whenever crystal lattices of definite compounds are formed through the interplay of their electric energy (valences) within molecules made unstable or active by heat or by solution, the X-ray remains as our most powerful tool in identification of chemical compounds and their lattice space changes during process reactions. However, the frequent gaps in the reaction picture are due to our inability to "see" beyond the crystalline aggregate stage, causing us to draw inferences from accompanying phenomena relating to heats of solution, solubility, refractive indexes, ion-concentration, and many more. In the analysis of raw materials especially, the additional techniques of petrographic examination and differential thermal analysis are increasingly brought into use here.

Aware of these limitations in analyzing pozzolanic materials for the purpose of predicting physical and chemical behavior, the investigator will have to rely primarily on conducting a variety of "use-tests" in order to evaluate their properties and effects under controlled conditions of processing and application. Lack of simple definition, specifications, and testing procedure of pozzolans has, no doubt, inhibited the more general acceptance, search for, and processing development of pozzolans. This need not be so. However, it is to point out guideposts, and to suggest caution, as well as optimism, that this discussion is presented.

Naturally, not every laboratory is equipped to run complete tests on raw materials for the required evaluation data needed, for processing research, and for simulative use performance. The would-be producer may have to ship his raw material samples to various commercial testing laboratories, university research stations, or technical institutes in order to obtain information on a wide enough basis to cover manufacturing considerations, use, and market development.

In the course of the writer's engineering research and testing of pozzolanic materials, several of the Bureau of Reclamation testing procedures have been followed. Upon first receipt of a sample, a trial petrographic and X-ray analysis is made in an attempt to classify the material. While the X-ray is primarily qualitative, petrographic examination may determine the predominant type of active material, and thus point to what further chemical analyses are of importance in regard to type of exchangeable alkali, combined water, etc., and what might be the best heat-activating range of temperatures.

Lime-Set Tests Since the pozzolan must show some cementing property with lime in order to be used, the first quick spot test we use is that of time-of-set with lime in paste form. This makes a good preliminary screening test for reactive materials. (The Bureau of Reclamation and others sometimes use compression tests on lime-pozzolan mortar cubes.) In a preliminary way, we crush the sample to minus 20-mesh, calcine for one hour in an electric muffle under oxidizing conditions (with periodic rabbling to expose all particles to air) at various temperatures, and then batch-grind the calcines and the raw samples to a pre-determined specific surface, noting the time of grinding in the ball mill for comparison basis. Twenty percent of the dried and screened hydrated lime is then blended under standardized conditions of mixing or intergrinding with the ground pozzolan sample, worked up with water to standard consistency, and allowed to set under lime water and kerosene in a container not less than two in. in diameter. Vicat needle penetrations are recorded at hourly intervals to determine both initial and final sets. From this test the approximate activating temperature range is determined for the purpose of cement replacement strength tests to follow.

Cement Mortar Tests A larger sample is now dried, or calcined in a muffle or small rotary kiln, and ground at least as fine as the particular portland cement used for testing, usually, however, to 3,000 sq. cm./gr. Blaine. Standard A.S.T.M. 2-in. mortar cubes are made up with the cement mix as standard in each test series, replacing 10 percent, 20 percent, and 30 percent of the cement with the pozzolan by weight. Specimens are stored under water and in a humidity chamber and tested at 7 and 28 days for compression values against the cement mortar cubes without replacements. This generally completes the initial sample strength evaluation tests to provide a relative cementing index under use conditions.

Chemical Activity Tests In testing the material for its ability to react with alkalies, exchangeable Na_2O tests and reduction of expansion-by-alkalies tests are made as described in the Bureau of Reclamation reports. While pozzolans with favorable ratings in these tests also rate high in sulphate resistance ability, this property may also be checked in order to evaluate the material for special usage in concrete exposed to low pH waters, aggressive soils, sulphates, and sea water. Tests on the relative solubility of reactive silica in lime media, under steam pressure, and other variations have been used. Reduction-of-expansion-by-alkalies test using pyrex glass aggregate and high-alkali portland cement in mortar bars has been superseded by a more rapid method for testing this ability of a pozzolan. In this new chemical test reported by R. C. Mielenz, the pozzolan is evaluated in this respect by its ability to reduce net alkali concentration of a 0.5 N sodium hydroxide solution after reaction with the pozzolan under 24 hr. stirring conditions in the presence of calcium hydroxide. The test is said to correlate well with, and is more reproducable than, the former direct expansion measuring test involving considerable time.

As pointed out earlier, there are more or less minor beneficial properties besides those just mentioned which can be studied and evaluated in the laboratory. There are also properties in some pozzolans which adversely affect the mortar and concrete in which they are used, such as those causing increased drying shrinkage or lowering of weathering resistance, even though these may be partially or wholly offset by the addition of certain air-entraining agents.

It might be pointed out under this phase of discussion that the use of commercial hydrated lime and portland cement in testing and standard comparisons is to be carried out with caution, as these materials are chemically and physically variable, both as to source and batch, and can easily affect results. It is therefore a good policy to screen or air-separate both lime and cement, and to work with only one source of supply. Some portland cement may be higher in tricalcium silicate, for example, and thus make available more released calcium hydroxide, even within any one class or type cement. Naturally Class I and II cements would require more pozzolan for this purpose than Class IV cement.

Pozzolans impart certain properties to mortars and concretes before, during, and after the setting of the cement. While the latter effects are most important, the tendencies of the pozzolan to affect plasticity, workability, water requirements, slump, shrinkage, water-tightness, time of set, heat of hydration, resistance to freezing and thawing, etc., should be determined in some reproducible quantitative manner, so that proper processing steps and techniques can be evolved to inhibit or enhance such properties.

The well-designed laboratory for this purpose is furthermore equipped with pilot-type processing facilities, not only to allow the pozzolans to be "designed" for specific purposes and market requirements, but also to obtain processing comparison, processing cost, and plant design data. Essentially such laboratory equipment consists of crushing and screening units that may be fed by hand for preliminary sizing. A small continuous dryer and calciner with close temperature control is essential, especially as later fine grinding in a ball mill is critically affected by moisture in raw materials. The fine-grinding setup should be automatically continuous in feeding with accurate rate setting control, and should include a feed hopper, a feeder, a ball mill, an elevator, and an air classifier. Particle size distribution and pozzolan properties obtained by continuous grinding differ markedly from those obtained with batch grinding of material.

(To be Continued)

Safety Contest Awards

(From page 26.)

Gravel Corp., La Platte, Nebr., 48,298 man-hours.

Bennett wet-pit, Tarrant Gravel Co., Birdville, Tex., 41,971 man-hours.

Lincoln dredge, The Lincoln Sand & Gravel Co., Lincoln, Ill., 41,751 man-hours.

Massillon dry-bank, The Canton Slag Co. (Sand Division), Massillon, Ohio, 37,980 man-hours.

Nos. 12–13 dredge, Lyman-Richey Sand & Gravel Corp., Fremont, Nebr., 36,875 man-hours.

Yardley wet-pit, Union Sand & Gravel Co., Spokane, Wash., 36,263 man-hours.

No. 2A dredge, Lyman-Richey Sand & Gravel Corp., La Platte, Nebr., 35,111 man-hours.

No. 390 dredge, Consumers Co., Lacon, Ill., 34,132 man-hours.

Chillicothe dry-pit, Basic Construction Materials Co., Chillicothe, Ohio, 32,900 man-hours.

Bethel dry-bank, Bernard J. Dolan Co., Bethel, Conn., 32,786 man-hours.

Steilacoom dry-bank, Glacier Sand & Gravel Co., Steilacoom, Wash., 32,159 man-hours.

South Bend dry-bank, Western Indiana Gravel Co., South Bend, Ind., 31,764 man-hours.

Akron dry-bank, Rubber City Sand & Gravel Co., Akron, Ohio, 31,520 man-hours.

Claremont No. 11 dry-bank, Consolidated Rock Products Co., Claremont, Calif., 31,452 man-hours.

Coxey dry-bank, Industrial Silica Corp., Dundee, Ohio, 31,301 man-hours.

Sierra No. 19 dry-bank, Consolidated Rock Products Co., Monrovia, Calif., 31,073 man-hours.

Slinger dry-bank, Palmer Crushing Co., Slinger, Wis., 29,857 man-hours.

Ludlow Falls dry-wet pit, Steiner's Sand & Gravel Co., Ludlow Falls, Ohio, 29,548 man-hours.

Butlerville dry-bank, Utah Sand & Gravel Products Corp., Salt Lake City, Utah, 28,874 man-hours.

Fairview dry-bank pit, Nickel Plate Sand & Gravel Co., Fairview, Pa., 28,306 man-hours.

Lebanon wet-pit, Lebanon Sand & Gravel Co., Lebanon, Oreg., 27,632 man-hours.

Winona dredge, Winona Sand & Gravel Co., Winona, Minn., 25,701 man-hours.

"AS" dry-bank, The Buffalo Slag Co., Inc., Alfred Station, N. Y., 25,524 man-hours.

Fort Wright dry-pit, Union Sand & Gravel Co., Spokane, Wash., 25,087 man-hours.

Yolo No. 131 wet-pit, Pacific Coast Aggregates, Inc., Yolo, Calif., 24,228 man-hours.

Leesburg dredge, Western Indiana Gravel Co., Leesburg, Ind., 23,945 man-hours.

Dresden No. 2 dry-pit, The Zanesville Gravel Co., Dresden, Ohio, 23,646 man-hours.

Trenton No. 2 dry-pit, Eastern Rock Products, Inc., Barneveld, N. Y., 23,217 man-hours.

Warren dredge, General Concrete Products Corp., Warren, Pa., 23,149 man-hours.

South Bend dry-pit, South Bend Sand & Gravel Corp., South Bend, Ind., 22,430 man-hours.

Olympia No. 125 dry-pit, Pacific Coast Aggregates, Inc., Felton, Calif., 22,219 man-hours.

Shelton dry-bank, The Grasso Construction Co., Shelton, Conn., 21,427 man-hours.

Hewitt No. 3 dry-bank, Consolidated Rock Products Co., North Hollywood, Calif., 21,188 man-hours.

Estherville dry-pit, Estherville Sand & Gravel Co., Estherville, Iowa, 20,215 man-hours.

"F" dry-bank, The Buffalo Slag Co., Inc., Franklinville, N. Y., 20,109 man-hours.

No. 15 dredge, Lyman-Richey Sand & Gravel Corp., Columbus, Nebr., 19,381 man-hours.

Anderson dry-bank, Western Indiana Gravel Co., Anderson, Ind., 17,403 man-hours.

Schmidt wet-pit, Riverside Gravel Co., Schmidt, N. Dak., 17,259 man-hours.

Wilton dry-pit, Hudson Valley Sand & Stone Co., Wilton, N. Y., 15,956 man-hours.

West Alexandria dredge, Steiner's Sand & Gravel Co., West Alexandria, Ohio, 15,027 man-hours.

Arno dry-pit, F. M. Reeves & Sons, Inc., Pecos, Tex., 14,503 man-hours.

Minneapolis dry-pit, Mapco Sand & Gravel Co., Minneapolis, Minn., 14,447 man-hours.

Brilliant dry-pit, The Brilliant Sand Co., Brilliant, Ohio, 13,351 man-hours.

Morris No. 1 dredge, Material Service Corp., Morris, Ill., 12,512 man-hours.

East Peoria dry-pit, Peoria Concrete Construction Co., East Peoria, Ill., 12,060 man-hours.

Camden wet-pit, White Gravel Co., Camden, Ohio, 11,960 man-hours.

Service wet-pit, Schadt Service Co., Silvis, Ill., 11,685 man-hours.

Follansbee dry-bank, The Brilliant Sand Co., Follansbee, W. Va., 10,443 man-hours.

Sand Springs dredge, Arkansas River Sand Co., Sand Springs, Okla., 10,278 man-hours.

"C" dry-bank, The Buffalo Slag Co., Inc., Cohocton, N. Y., 9,742 man-hours.

Smithtown dry-pit, Metropolitan Sand

(Continued on page 68.)

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INTERNATIONAL is the most-wanted truck in the heavy-duty field. For the past 22 years, cost-conscious operators have found that INTERNATIONAL quality, dependability and *all-truck* stamina keep operating and maintenance costs to a minimum.

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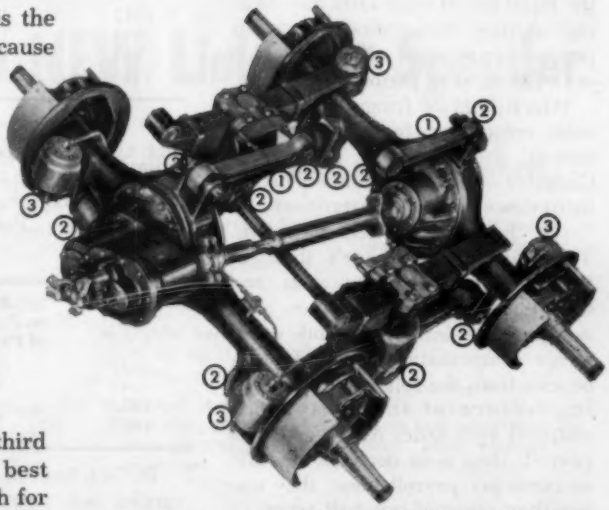

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3. New self-contained brake and cylinder unit cuts servicing costs, offers greatly increased protection from damage in off-highway operation.

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Report on Current Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger and Company
Industrial and Labor Economists
Washington, D. C. - Philadelphia, Pa.

Growth of Fringe Payments

another P and Q exclusive

The Chamber of Commerce of the United States has made a very important survey every other year since 1947 on fringe payments. This is the only national survey on the subject; it fills a gap not covered by government or any other privately compiled statistics.

Now that the fourth survey—for 1953—has been released, some very interesting, and perhaps alarming, trends are evident.

For a group of 30 identical companies which have participated in the survey since its inception in 1947, fringe payments have risen as follows:

	Fringe Payments	
	As Percent of Payroll	As Cents per Payroll Hour
1947	15.2	20.7
1949	16.9	26.0
1951	19.1	33.0
1953	20.2	33.2

Regardless of whether they are viewed in percentage terms, or as cents per hour, fringe payments have increased substantially in the post-war years. As a percent of payroll, they have increased from 15 to 20 percent since 1947; but because of the rapid rise in wage rates and earnings during that period, the cents per hour payments almost doubled over the six-year period.

Which kind of fringe benefits are most responsible for the rise? To answer this question, the U. S. Chamber of Commerce survey breaks them down into five categories:

(1) Legally required payments. These are the employer's share of Federal Social Security costs and state unemployment insurance, sickness benefits insurance, and workmen's compensation costs. As may be seen from the following table, the importance of these payments changed very little. As a percent of payroll, they even declined slightly; as cents per payroll hour, they rose less than one and one-half cents.

	Fringe Payments	
	As Percent of Payroll	As Cents per Payroll Hour
1947	3.0	5.1
1949	2.8	4.3
1951	3.2	5.5
1953	2.9	5.5

(2) Payments for pensions, health and welfare benefits, termination pay, discounts on goods and services and miscellaneous payments (such as for free meals), as may be seen from the following table, rose in about the same proportion as the total of fringe benefits—about a one-third increase in the percent of payroll and about a doubling in cents per hour. Over the years covered, these payments added an average of 6.5 cents per hour to payroll cost.

	Fringe Payments	
	As Percent of Payroll	As Cents per Payroll Hour
1947	4.4	6.0
1949	5.2	8.0
1951	5.6	9.7
1953	6.6	12.5

(3) Paid rest periods, lunch periods, wash-up time, travel time, clothes-changing time, get-ready time, etc. Here the figures are as follows:

	Fringe Payments	
	As Percent of Payroll	As Cents per Payroll Hour
1947	1.6	2.2
1949	1.8	2.8
1951	2.0	3.5
1953	2.2	4.2

(4) Payments for time not worked, such as paid vacations, paid holidays, paid sick leave, and payments for National Guard duty, jury duty, witness duty, etc. Here the figures are as follows:

	Fringe Payments	
	As Percent of Payroll	As Cents per Payroll Hour
1947	5.0	6.8
1949	5.9	9.1
1951	6.8	11.7
1953	7.1	13.4

In fact, both of the preceding categories are payments for time in which no productive work is performed. As a percent of payroll, the total of such payments was 6.6 percent in 1947 and had risen to 9.3 percent by 1953. As cents per payroll hour, the total of such payments was 9 cents in 1947 and had risen to 17.6 cents by 1953.

(5) In addition, there are certain miscellaneous payments such as profit-sharing payments and Christmas or other special bonuses and awards which account for a very small proportion of the total and have changed very little since 1947.

Clearly the bulk of the rise in fringe payments can be attributed to the increased importance of (1) pensions and health and welfare programs, and (2) payments for time during which no productive work is done. The former has been well publicized and the increased cost was expected; the even larger rise in payments for time *not worked* comes as something of a surprise.

Future Growth of Fringe Payments

The firmly established trend toward rising fringe payments appears likely to continue for some time.

The legally required payments for Federal Social Security benefits have recently been increased so that the 2 percent tax payable by employers, starting January, 1955, will be payable on earnings up to $4,200 per year instead of up to only $3,600 per year, as heretofore. Also, this tax is scheduled to go to 2½ percent in 1960 and rise to a maximum of 5 percent in 1975.

Unemployment insurance contributions are also likely to rise primarily because the recent increase in unemployment will cause many firms to lose all or part of their advantageous merit rate achieved during a long period of practically full employment. In addition, certain small firms with between 4 and 8 employees not previously covered in Alabama, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin will be covered beginning January, 1956.

Also, legislation has been introduced in many additional state legislatures for the establishment of sickness benefit insurance. It is likely that some additional states will join those which already have such a program in operation, further increasing the legally required payments on behalf of employees.

(Continued on page 104)

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WASHINGTON NEWS LETTER

another P.Q. exclusive

AS IS usual at this time in a Congressional election year, all of Washington is watching the developing races back in the states and the Congressional districts.

Although elections will be held for 37 Senate seats this year, the outcome of all but 12 of those contests appears to be pretty well decided by this time. The control of the Senate depends upon what happens in the following 12 states:

Colorado—where the final contestants for the seat of Democratic Senator Johnson are not yet known at this writing

Delaware—where Democratic Senator Frear is opposed by Republican Representative Warburton

Illinois—where Democratic Senator Douglas is opposed by Republican businessman Meek

Iowa—where Democratic Senator Gillette is opposed by Republican Representative Martin

Kentucky—where Republican Senator Cooper is opposed by former Vice-President Barkley

Massachusetts—where Republican Senator Saltonstall is opposed by Democratic State Treasurer Furcolo

Montana—where Democratic Senator Murray is opposed by Republican Representative D'Ewart

New Jersey—where Republican Representative Case is opposed by Democratic Representative Howell

New Mexico—where Democratic Senator Anderson is opposed by Republican Governor Mechem

Ohio—where Democratic Senator Burke is opposed by Republican Representative Bender

Oregon—where Republican Senator Corden is opposed by Democratic State Senator Neuberger

Wyoming—where former Democratic Senator O'Mahoney is opposed by Republican Representative Harrison.

All of these contests appear to be very close except perhaps in Kentucky, where the personal popularity of former Vice-President Barkley is expected to be an important factor in getting him elected. Even here, however, the outcome is by no means predictable.

In each of these states the Republican candidate is generally running on the Eisenhower record, and the Democrat is criticizing that record. Now that Congress has gone home, nothing can change that record before the election. That the outcome in these states remains seriously in doubt indicates that the Eisenhower record *alone* will not elect a Republican.

The strategy of the Republican Party in this situation is clearly known. Where the candidate's own popularity plus the Eisenhower record are not sufficient to asure victory, the Administration will send in strong reenforcements, currently in the persons of Vice-President Nixon and/or Speaker Martin. If still stronger reenforcements are required and there is a reasonable chance of victory, President Eisenhower himself may go in.

There are so many factors which determine the outcome of a close election race that it is difficult to select the predominant forces. Nevertheless, when the campaigns are considered and the likelihoods are evaluated, the discussions seem to end with two unanswered questions: (1) How serious is unemployment in the state? and (2) How are farmers in the state doing? If both the workers and the farmers are doing well, the Republicans seem to feel that they will carry the state. If either one of these important groups of voters is not doing too well, the Republicans show concern. If both groups are not doing well, the Republicans look downright worried.

The Democrats, on the other hand, are in the very ungracious position of expecting to benefit from adversity. They expect to win in the areas where the workers and/or the farmers are doing badly.

Data recently published by the U. S. Department of Commerce on changes ni agricultural income and manufacturing payrolls for each state sheds some light on these basic questions.

For the country as a whole, agricultural income fell by 12 per cent between 1952 and 1953 while total manufacturing payrolls rose by 11 per cent. The outcome of the election in a particular state having a Senate seat in doubt may be decided by the fact that the farmers and workers there did better or worse than the national average.

This is a hypothesis which some of the "sharp pencil boys" in Washington are working on now. Here is what they are discovering.

In Colorado agricultural income fell by 24 per cent, far greater than the national average; and manufacturing payrolls rose by 9 per cent, which is less than the national average.

In Delaware agricultural income fell by 11 per cent, slightly less than the national average; but manufacturing payrolls rose by only 9 per cent, slightly less than the national average.

In Illinois agricultural income fell by 13 per cent, more than the national average, while manufacturing payrolls rose by 11 per cent, the same as the national average.

In Iowa agricultural income fell by 24 per cent, far more than the national average, while manufacturing payrolls rose by only 5 per cent, far less that the national average.

In Kentucky agricultural income fell by only 2 per cent, while manufacturing payrolls rose by 15 per cent.

In Massachusetts agricultural income fell by only 2 per cent, while manufacturing payrolls rose by only 8 per cent, less than the national average.

In Montana agricultural income rose by 4 per cent, contrary to the national trend, while manufacturing payrolls rose by 7 per cent, less than the national average.

In New Jersey agricultural income rose by 2 per cent, also contrary to the national trend, while manufacturing payrolls rose by 8 per cent, less than the national average.

In New Mexico agricultural income fell by 30 per cent, far more than the national average, while manufacturing payrolls rose by 10 per cent, slightly less than the national average.

In Ohio agricultural income fell by 6 per cent, less than the national average, while manufacturing payrolls rose by 13 per cent, more than the national average.

In Oregon agricultural income fell by 12 per cent, the same as the national average, while manufacturing

(*Continued on page* 62)

★★★★

BIG ROCK'S

Triple M's subsidiary erects highly-mechanized 1,000-t.p.h. plant in Arkansas, featuring jet piercing, extreme flexibility, and unique layout.

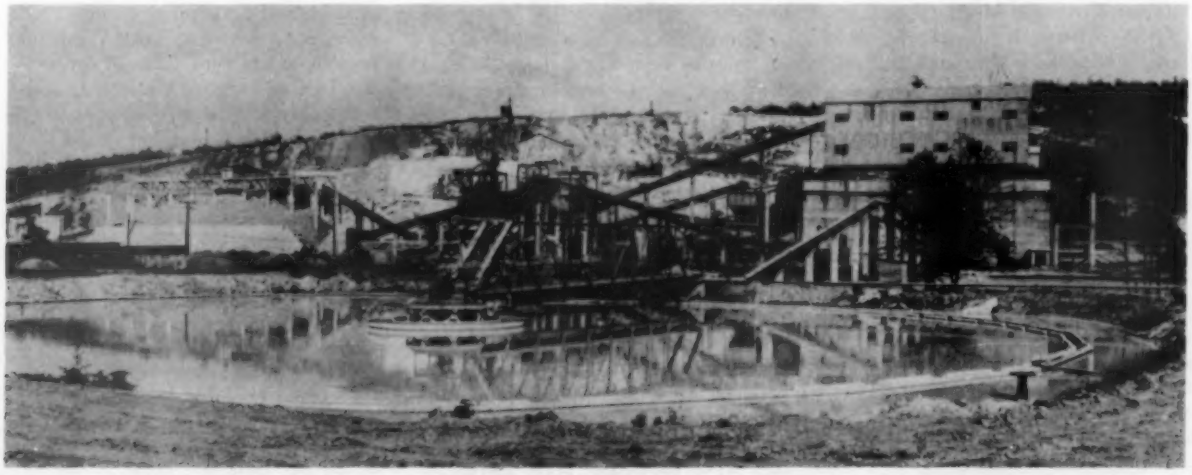
New Quarry at Little Rock

By KENNETH A. GUTSCHICK

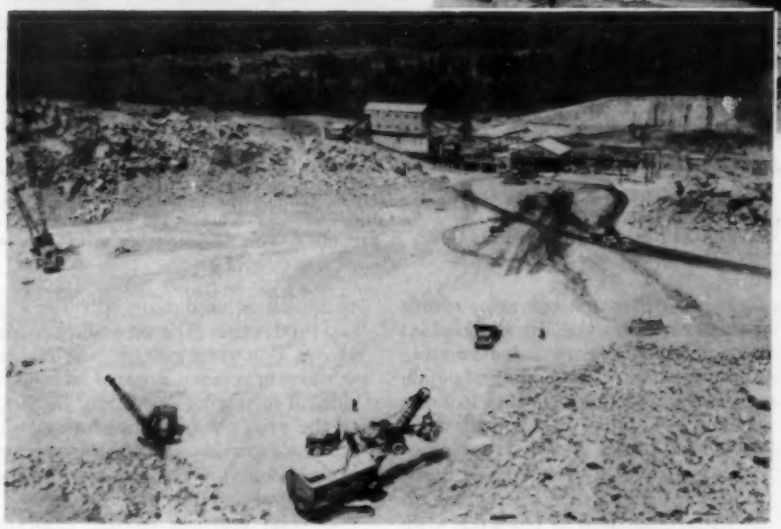
another ON THE SPOT report

HIGH production, an ultra-flexible flow sheet, and a unique plant layout are but a few of the features characterizing the new crushed stone plant of the Big Rock Stone & Material Co., Little Rock, Ark., a wholly-owned subsidiary of the Minnesota Mining and Manufacturing Company, making it one of the outstanding quarrying operations in the country. Capable of producing more than 2,500,000 tons per year, the plant turns out at a 1,000 t.p.h. rate the gamut of crushed stone products —everything from derrick stone and riprap down to and including stone sand. Although operations of this magnitude are not uncommon today, Big Rock especially stands out in view of the fact that the deposit being worked is syenite—a hard, tough, massive, crystalline igneous rock which is very similar to granite and therefore relatively difficult to blast and crush.

The new operation replaces the firm's older North Little Rock quarry, which had to be abandoned due to deposit depletion. However,



Panoramic view of the new 1,000 t.p.h. Big Rock Stone & Material Co. operation just south of Little Rock, Ark., taken from the west. In the foreground is the 140-ft. dia. thickener, with the huge surge pile on the left, the finish mill building on the right, and the syenite quarry in the background.



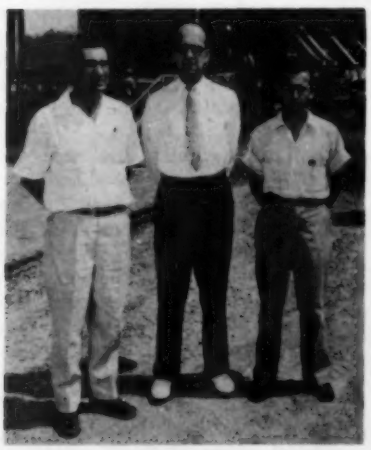
Two more general views of the Big Rock operation, taken from the east.

Left: the quarry, stone plant, and 125-acre artificial reservoir (background). Two primary crushing stations are used, which are located on the quarry floor at the far end. A drop ball crane and electric shovel are seen in the foreground.

Above: Closeup of the stone plant, showing the riprap hopper in the foreground and the finish mill building and tertiary crushing stations in the background.

it has more than twice the capacity of the older plant.

In carrying out this major expansion project, Big Rock executed a well-planned construction program, which involved simultaneously the gradual dismantling of the North Little Rock stone plant, the re-erecting of these units, and the building of additional facilities at the new site. The rebuilding was done in piecemeal fashion, so that there would be little or no production loss; thus, as soon as sufficient units were set up at the new site, production was started there. The shift was managed so skillfully that both plants were in operation during much of the changeover. Begun in the latter part of 1951, the shift was completed (that is, the older plant was shut down and the new one in full production) in January of this year. However, the finishing touches in the construction program were not completed until mid-1954.

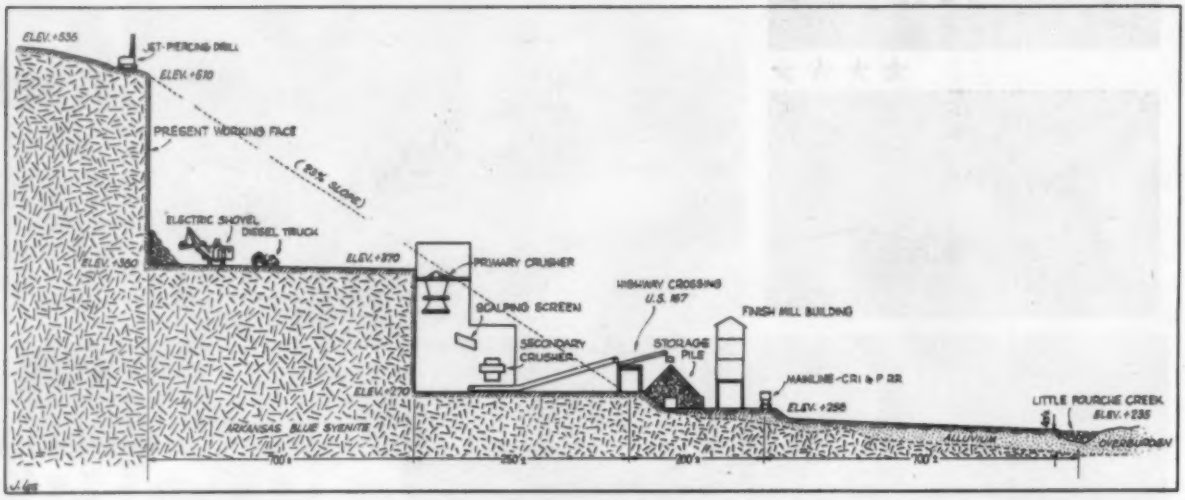


Three key men at the Big Rock plant are (left to right) T. M. Howell, superintendent; W. E. Vroman, vice-president and general manager; and W. B. Tracy, plant engineer.

In setting up the new operation, which is located on "Granite Mountain", about two miles south of the Arkansas capital city, the firm encountered a serious plant layout problem due to space limitations. There was only a very narrow strip of flat land available for plant construction, and this area was situated between two busy transportation arteries—namely U.S. highway 167 and the mainline of the C.R.I. & P. R.R. Farther to the west was the swampy alluvial floodplain of Fourche Creek (an Arkansas River tributary), but this poorly drained area was unsuitable for footings and foundations (the soft alluvial fill exceeds 25 ft. in most places). Consequently, the plant was laid out as shown in the cross-section (p. 54).

The larger of the two jet piercing drills, which was converted to jet piercing in May 1954. The machine averages 20 f.p.h. (10-in. dia. holes) in a tough syenite rock formation. The drilling operator works from the enclosed platform.

As may be seen from this illustration, the quarry is being developed on the mountain flank, the primary crushing station being located on the



Schematic cross-section of the Big Rock operation, showing the unique plant layout. The main plant facilities are located on a flat stretch of land between the highway and the railway. The deposit being worked, which is part of "Granite Mountain," is referred to as the Arkansas blue syenite.

quarry floor overlooking the highway. A portion of the mountain was blasted and excavated back from the highway in order to provide space for the primary scalping screens, the secondary crusher, and a spur track for riprap loading. The plant proper, including a large surge pile and the various mill buildings, is located between the highway and the railroad track, paralleling both of these transportation lines. A bridged conveyor spans the highway and feeds the surge pile. To the west of the plant the firm has built a 125-acre reservoir used to supply wash water.

Another major construction project involved in the new plant project was the building of a two-mile rail spur connecting the plant with the Missouri-Pacific R.R., thus making the plant accessible to a second major rail line. To carry out this project, it was necessary to divert Fourche Creek temporarily in order to construct a railroad bridge across it.

Special Features From an operating standpoint the Big Rock plant exhibits a large number of interesting features, some of which are unique to the industry. Primary drilling is handled by two well drills converted to jet piercing—a method fairly new to the crushed stone industry; drilling rates average about 20 f.p.h. compared to 1½ f.p.h. with conventional well drills. Blasting procedures, although standard, are carefully undertaken; and each shot is measured by a seismograph. Further, all shots and holes are surveyed for elevation and horizontal control.

In the quarrying operation, four medium-sized shovels and ten haulage units are used to maintain the 1,000 t.p.h. production. Two primary crushers handle the material, one of which is used especially for riprap production. The secondary crusher is a 7-ft. cone crusher, the largest cone ever made. Because this is a sidehill quarrying operation, the flow to the primary and secondary crushers is *via* gravity; from the secondary crusher on, an elaborate system of belt conveyors is utilized.

Special features in the crushing and screening circuits include the following: movable belt conveyor framework under the primary jaw crusher, which allows access to the crusher during repair; movable feeders in the reclaiming tunnel under the surge pile; a reversible belt conveyor serving two fine-reduction cone crushers; unique conveyor construction consisting of double rectangular steel trusses, the entire framework being mounted on single concrete piers; use of a central air compressor station; and use of a thickener for handling wash water. (At present it is not used for reclaiming fines but rather for purifying the water for re-use.)

Extreme flexibility has been incorporated in the flow sheet, permitting a well-balanced production of a large variety of stone sizes. The plant makes use of a single surge storage pile following the secondary crusher. From that point on, production can be varied at will, and perfect co-ordination is possible between sales and production. Because of this fact, stockpiles are used to a limited extent only.

Major plant facilities include 2 primary crushers (a jaw and a gyratory), 6 cone crushers used for secondary and tertiary reduction, 2 scalping screens, 16 secondary and

The Big Rock quarry is a beehive of activity, with its 4 shovels, 2 drop-ball cranes, 10 heavy-duty trucks, and 2 bulldozers, most of which are shown here.

finish screens, and 2 sand washers. Because of this large number of plant facilities, the loss of one unit generally does not curtail production, since the material can readily be diverted to other units. This is particularly evident in the finish screening building, where the screens are mounted on a dual basis, with parallel units arranged along the center line of the building.

QUARRYING OPERATION

Geology The deposit on Granite Mountain is designated the Arkansas Syenite[1]; it was intruded into the Paleozoic sedimentary rocks of the area during the Cretaceous period. The intrusive igneous body, of which Granite Mountain is a part, is commonly referred to as a "boss" or "stock" by geologists. Minerals present in the syenite include orthoclase feldspar (60 percent), nepheline (10 percent), hornblende (10 percent), diopside (5 percent), and the remaining 15 percent of titanite, apatite, magnetite, and biotite mica. The following is a chemical analysis of the syenite:

	Percent		Percent
SiO_2	60.30	MgO	1.19
Al_2O_3	19.93	Na_2O	6.25
Fe_2O_3	4.67	K_2O	5.30
TiO_2	1.10	Ignition loss	0.11
CaO	1.27		

The physical characteristics are as follows:

Percent of wear....3.3 percent Loss (Deval abrasion test)
Soundness....0.37 percent Loss (20-cycle sodium sulphate test)
Specific gravity 2.65

The overburden at the quarry site is very thin, varying from 0 to 4 ft.; it is removed on contract. Generally a year's supply of rock can be stripped in less than a month.

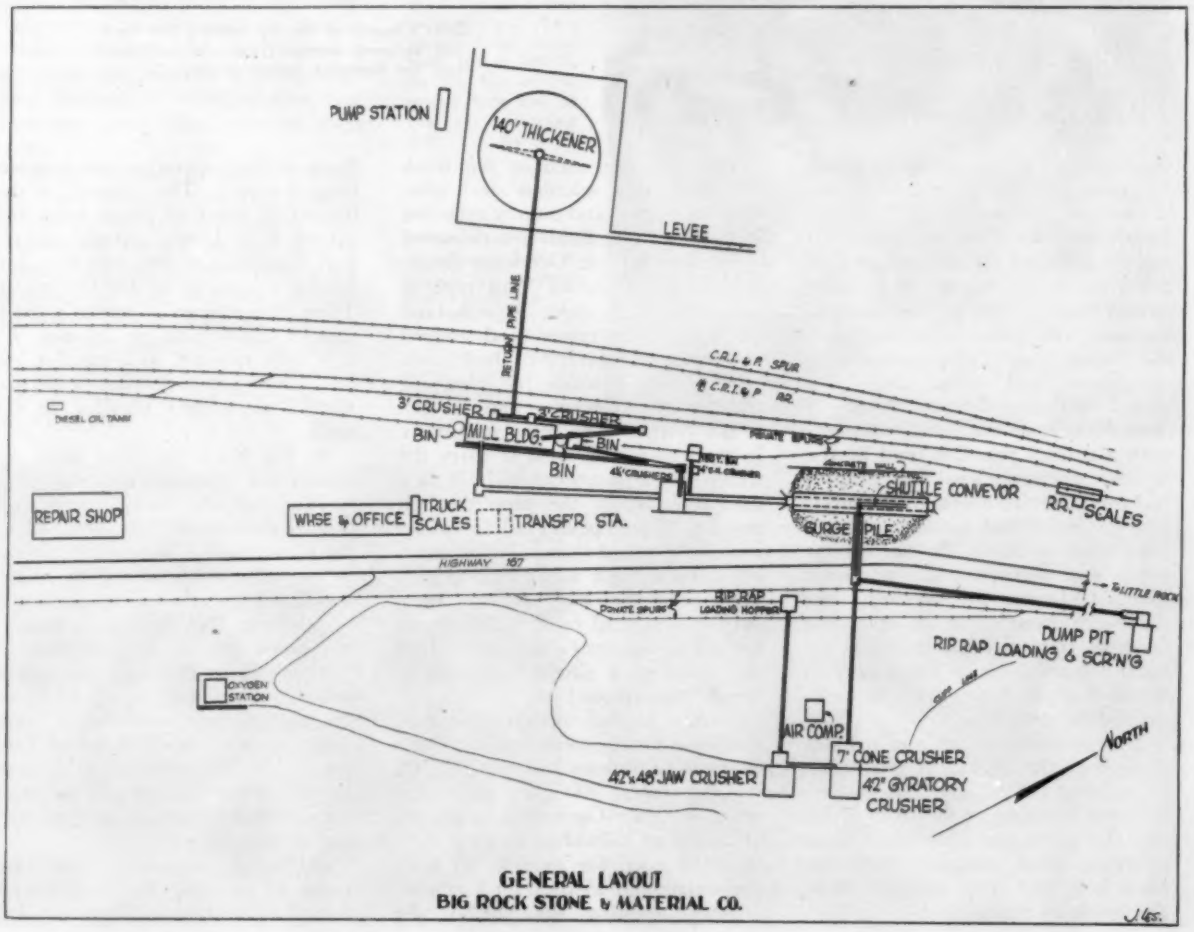
Jet Drilling, Blasting In the application of jet piercing to drilling crystalline (granitic) rocks, the Big Rock firm has been one of the pioneers. It converted its first well drill (a Bucyrus-Erie 27T) to jet piercing nearly two years ago and its second drill (a B-E 29T) in May of this year. Presently these two drills, plus another 29T conventional machine, handle all primary drilling requirements. (The latter is generally used in relatively inaccessible places.) The conversion was undertaken with the co-operation of the Linde Air Products Company, which developed the process.[2]

In flame drilling a suspension-type water-cooled burner pipe is used, operated with a short spudding stroke; a kerosene-oxygen flame, having a temperature of about 4,500 deg. F. and a linear velocity of 6,000 f.p.s., does the actual drilling through a spalling action. Water is used in the process not only to prevent the burner pipe from melting but also to form steam which blows the spalled material to the surface.

At the Big Rock operation a 5-in. blow pipe is used. Instead of the 18-in. stroke normally applicable in churn drilling, the spudding action of the 29T unit was adjusted to give

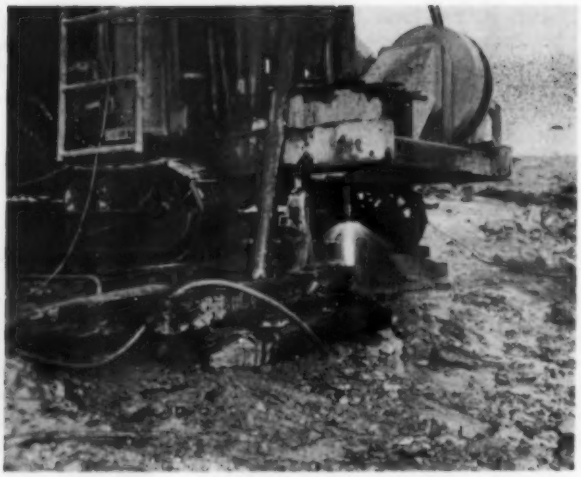
[1] Syenite is similar to granite in that it is a light-colored, acidic, coarsely-crystalline intrusive igneous rock; it differs from granite in its lacking of quartz although it has a much larger percentage of feldspar (particularly orthoclase).

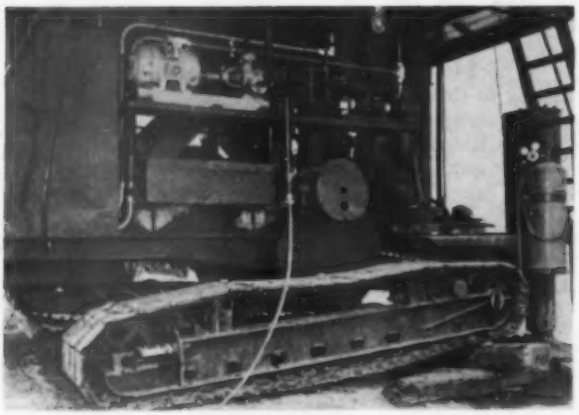
[2] Bucyrus-Erie is now planning to introduce a jet-piercing drilling machine shortly, which will make this type of conversion no longer necessary.



General layout of the Big Rock plant at Little Rock, Ark.

GENERAL LAYOUT
BIG ROCK STONE & MATERIAL CO.





Three views of the reconverted jet piercing well drills.

Above, left: The entire drilling operation is controlled from the operating floor shown here. To the right of the driller is the control panel which indicates water, kerosene, and oxygen pressures.

Above, right: Here the 5-in. burner pipe, with its 4,500 deg. F. flame, is shown entering the blast hole. The exhaust fan is mounted at the right of the burner pipe.

Left: Closeup of the rig showing the water and kerosene pumps (top) and acetylene tank for blowpipe igniter (right).

the blowpipe a 7-in. stroke at about 45 cycles per minute (a 5-in. stroke is used on the smaller 27T drill). In addition, the boom was shortened and an auxiliary sheave was installed a few feet below the top sheave; the second sheave handles the oxygen, kerosene, and water hoses leading to the burner pipe. Oxygen-regulating equipment and water and fuel pumps were installed on the rig. A special enclosed platform, complete with a control panel, is used by the drilling operator, enabling him to control the entire operation. Controls include individual pressure gauges for the three fluids, flowmeters for water and kerosene, and necessary switches. Levers for operating the drill were extended to the operating floor. Warning lights installed on the control panel indicate any failure in liquid flow, in order that the drilling can be stopped.

For removing steam and exhaust gases from the operating area, a 36-in. exhaust fan (1,750 c.f.m. capacity) was installed on the front of the rig; the gases pass through a large collector hood mounted over the blast hole and then through 30-in. ductwork to atmosphere.

The blowpipe used at Big Rock is a 15-ft. long seamless steel tube, with the burner and reamer attached at its base. The fluids are delivered to the blowpipe in Goodyear Emerald Cord 2-in. hoses. This type of hose is used in order to withstand the high temperature and rugged operating conditions. Individual tubes mounted inside the blowpipe transfer the kerosene and oxygen to the burner. The remaining space in the blowpipe is used to carry the water to the burner, which is then discharged from the pipe through myriads of jet openings. The burner is a single-orifice type in which kerosene and oxygen are atomized and mixed, and then burned under pressure in a special combustion chamber. The hot gases are ejected in the form of a single high-velocity flame. (See photo.)

Under normal operating conditions the hourly consumption of the fluids is as follows: oxygen, 10,000 cu. ft.; water, 700 gal.; and kerosene, 40 gal. Operating pressures, recorded on individual gauges, average 140 p.s.i. for oxygen, 80 p.s.i. for water, and 45 p.s.i. for kerosene.

An interesting sidelight of the flame-drilling operation concerns the oxygen supply. The material is delivered by truck in liquid form and placed in a Linde cascade storage unit consisting of 496 cylinders and having a capacity of 140,000 cu. ft. There the oxygen is under a pressure of 2,200 p.s.i. at 70 deg. F.; it is later reduced to a gas (at 140 p.s.i.) and piped through a permanent 2-in. welded pipeline to the drill.

At Big Rock the blast holes are drilled to a minimum diameter of 10 in. However, the lower 15 ft. of each hole is chambered (to about 12 in. dia.), so that the powder factor can be increased at the base. This chambering effect, which is accomplished by slowing the drilling operation, represents one of the inherent advantages in jet drilling. The general practice is to drill to 10 ft. below the quarry floor and then to refill with stemming material before loading to 5 ft. below bottom; this practice eliminates the necessity for cleaning out filled-in holes through baling or redrilling.

During the two years it has been using jet piercing, Big Rock has attained an average drilling rate of 20

f.p.h., which exceeds by many times the earlier 1½ f.p.h. rate of the well drills. Occasionally the drilling rate has even reached 50 f.p.h. Besides speeding up the drilling operation greatly, the new method has likewise decreased cost per foot figures considerably.

The quarry is worked in a single lift, with the face varying in height from 100 to 160 ft. Holes are drilled on 32-ft. centers with 22-ft. burden. Generally 4 to 10 holes, in a single row, make up a single shot which brings down 25,000 to 60,000 tons of material. Hercules 5-in. cartridges, including 70 percent semi-gelatin and 48 and 60 percent ammonium nitrate, are used, the faster explosives being placed at the bottom. Because of the large spacing pattern the dynamite is loaded solid to within 20 ft. of the surface. To increase the powder factor at the base, and thereby eliminate toe conditions, the cartridges are slit in the basal zone. With this type of loading, the firm obtains a yield of 3 tons of stone to 1 lb. of explosives.

The holes are detonated by means of Primacord; Dupont MS-17 Primacord connectors provide the delay. To prevent possible misfiring, double Primacord lines and double fusing are used. An electric blasting cap, fired through a 440-v. electric line from the plant office, sets off each blast.

Precise blasting is made possible not only through careful blasting practices but also through careful engineering control of the spacing pattern and hole depth. The practice of surveying each hole also permits accurate calculation of blasting tonnages. Vibration effects are carefully studied by means of a Leet 3-component seismograph, which is set up for each blast.

Excavating and Hauling One of the most amazing features at Big Rock concerns the quarry operation itself. Figuratively, it could be referred to as a beehive of activity, for in order to process stone at a 1,000 t.p.h. clip, the firm makes use at any one particular instant of 4 shovels, 10 haulage units, 2 drop ball cranes, and 2 bulldozers. Were it not for the fact that the quarry floor sprawls over about 100 acres, undoubtedly a traffic cop (maybe two) would have to be on the company payroll!

Excavating equipment consists of three electric Bucyrus-Erie shovels (Models 85B, 100B and 54B, fitted with 3¼-, 3-, and 2½-cu. yd. buckets respectively), and a 2½-cu. yd. Northwest 80D shovel, which is powered by a Murphy diesel engine. The latter machine, because of its maneuverability, is generally used for special clean-up duty. In addition, the firm has a standby 3½-cu. yd. P&H 1055 shovel, which is powered by a Caterpillar D375 diesel engine. For quarry run riprap loading, a Lorain 80 shovel, mounting a 1¾-cu. yd. bucket, is placed in service.

All secondary breakage is handled by a Northwest 25 diesel crane carrying a 6,000-lb. Cape Ann forged steel drop ball and a Marion 392 diesel crane-shovel carrying a similar 8,000-lb. drop ball. Finally there is a ¾-cu. yd. Lima Paymaster crane which is used on stripping, repair work, etc.

In the company's fleet of heavy-duty haulage units, there are six end-dump trucks (four Euclid and two Hug,) and four Easton TR-10 side-dump trailers pulled by International tractors. Cummins diesel engines are installed in all of the haulage units. Quarry cleanup and road maintenance is taken care of by Caterpillar D7 and International TD-14 tractor-dozers. Presently the quarry haul is relatively short—less than ½ mile, and loads vary from 15 to 20 tons.

Right: One of the drop ball cranes used for secondary breakage. The quarry face varies from 100 to 160 ft. At the top of the quarry face one of the jet piercing drills can be seen.

Below: Quarry loading scenes. Left: A 3¼-cu. yd. electric shovel loading a 10-cu. yd. side-dump tractor-trailer. Right: A 2½-cu. yd. diesel shovel filling a 15-ton end-dump truck.

General view of the primary and secondary crushing stations (background) and the riprap bin (right foreground). This photo was taken before the secondary crusher station housing the 7-ft. cone crusher (left) was enclosed.

A portable 42-in. by 80-ft. belt conveyor is mounted on rails beneath the primary jaw crusher; when it becomes necessary to inspect or repair the jaw, the conveyor can readily be moved out.

STONE PLANT

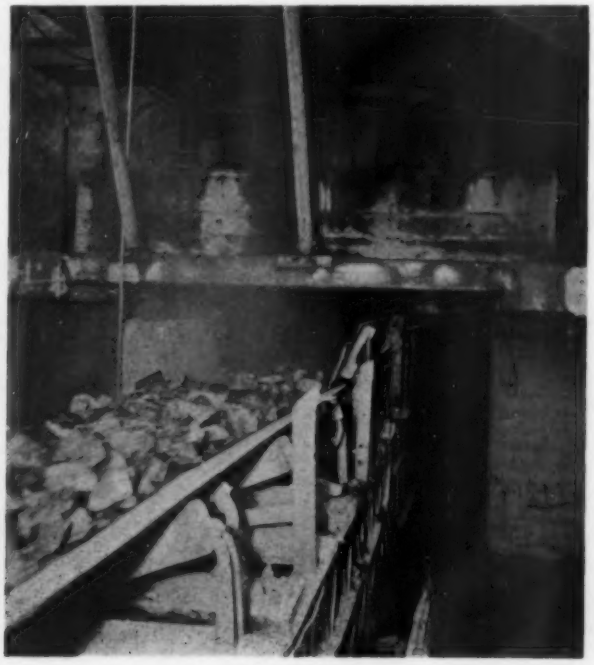
Primary, Secondary Crushing Two primary crushing stations are utilized, both located on the quarry floor about 100 feet apart. Both crushers can be fed from either the trailers or the dump trucks. A special dumping bridge having an Easton elbow-type dumping mechanism is installed at each crusher for the side-dump units; the hoist is automatic and incorporates a brake, an up-and-down limit switch, and a 3-unit pushbutton station. By means of this mechanism trailers can be unloaded rapidly.

In one primary crushing circuit, which is used for riprap production, a Stephens-Adamson 5- by 10-ft. apron feeder discharges the quarry-run material to an Allis-Chalmers 42- by 48-in. jaw crusher; this unit is driven through multiple V-belts by a 200-hp. Westinghouse Type CW slip ring motor. The crusher product is then transferred on a 42-in. by 80-ft. belt conveyor to a Hewitt-Robins 5- by 12-ft. single-deck scalping screen.

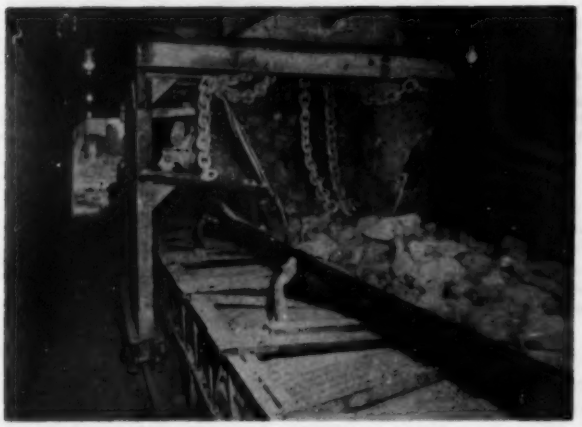
This screen, which has a stepped deck, is fitted with perforated steel cloth; 2- by 6-in. (2- by 8-in.) openings are used in the first section and 6-in. (8-in.) square openings in the second section. A unique feature at this point is that the 80-ft. conveyor is a portable rail-mounted unit. When it becomes necessary to repair the jaw crusher, the conveyor can readily be moved out of the way.

Riprap from the scalping screen is carried on a 48-in. by 120-ft. loading out belt conveyor and discharged to a 175-ton concrete bin mounted over a spur-track. Because of the size and weight of the riprap, the bin gates are relatively large and are operated by 8- by 36-in. double-acting tandem air cylinders. Production of riprap approximates 200 t.p.h.; generally the material is not stockpiled. Undersize material from the scalping screen, produced at a rate of 100 to 300 t.p.h., is conveyed on a 36-in. by 90-ft. belt conveyor to a feed box ahead of a second scalping screen.

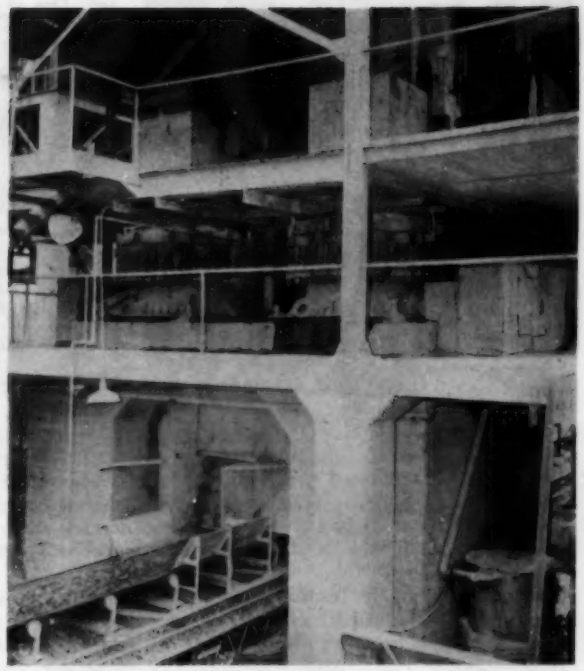
Right: The secondary crusher is a 7-ft. cone, the largest of its type in the industry; it is driven by a 250 hp. motor.



Below: Looking down on one of the 5- by 12-ft. scalping screens, which is located ahead of the secondary crusher.



One of the two portable vibrating feeders serving the tunnel belt conveyor beneath the surge pile.



Right: the two 4¼-ft. cone crushers which reduce plus 1½-in. material scalped off a pair of 5- by 14-ft. screens (above).

The other primary crusher is an Allis-Chalmers 42-in. gyratory, having a drive identical with that used for the jaw crusher; it is fed directly by the haulage units. To cut down on dust at this point, the firm has installed a dust collector fan which exhausts to atmosphere.

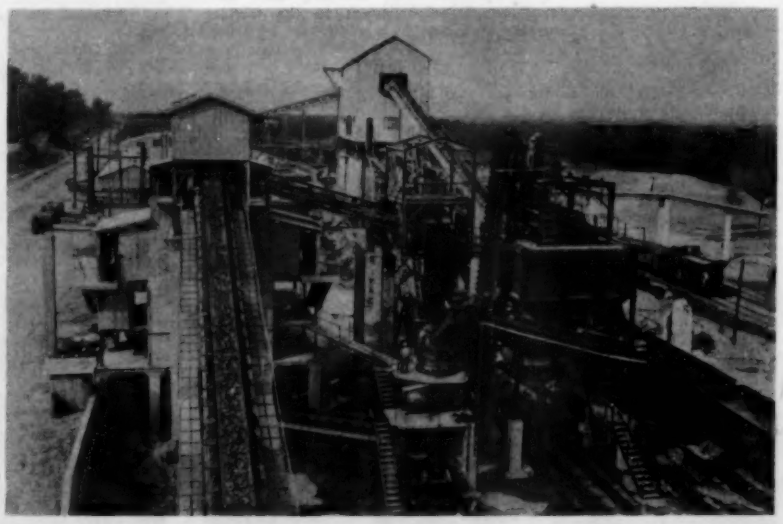
The crusher product is fed to a Hewitt-Robins 5- by 12-ft. single deck scalping screen, which is fitted with perforated steel cloth having 4-in. square openings. Rejects from the screen are chuted to the secondary crusher—a Symons 7-ft. cone unit, which is driven by a 250-hp. General Electric Type K slip ring motor.

Minus 4-in. material from the screen joins the cone crusher product and is carried on a 42-in. by 520-ft. inclined belt conveyor to a transfer tower, thence on a bridged 48-in. by 110-ft. belt conveyor crossing the highway. The latter conveyor is tightly enclosed to prevent spillage. A 48-in. by 65-ft. shuttle belt conveyor then distributes the material to a large surge pile. This pile, which has a live storage capacity of 10,000 tons, parallels the highway and railroad line. Because of close quarters, concrete retaining walls have been installed to confine the pile.

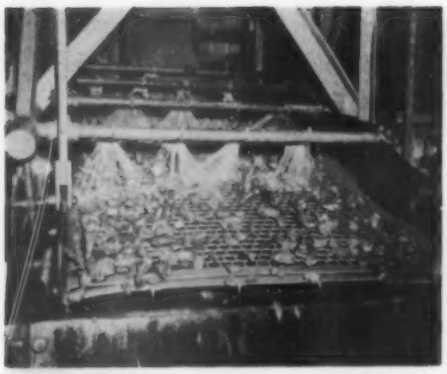
Stone is reclaimed from storage *via* a 42-in. by 330-ft. tunnel belt conveyor. The tunnel, made of concrete, is 8 by 12 by 200 ft. in size; it has five gates, which discharge to two portable Jeffrey-Traylor No. 5 vibrating feeders. The latter units are mounted on rails and hence portable.

Tertiary Crushing Beyond the surge pile there are three main sections to the stone plant. These include first a tertiary crushing station equipped with two scalping screens and two cone crushers; next the mill building proper, with its multiple screens, two fine-reduction cone crushers, and two sand washers; and finally an auxiliary crushing station having a cone crusher and two screens. The latter production unit, latest facility to be installed, augments the production of road base material, and also produces special material, thus adding considerably to the overall plant flexibility.

In the first section stone is delivered from the surge pile to a pair of Simplicity 5- by 12-ft. 2-deck screens with 1½-in. openings which are mounted over two bins. Oversize from the screens is scalped off and chuted to two Symons 4¼-ft. cone crushers. The minus 1½-in. to dust material is split to the two bins. Product from one bin is then transferred on a two-stage inclined belt conveyor to an all-steel truck loading bin; this material represents crusher run or road base stone. Material from the other bin joins with the cone crusher products and is fed *via* a 42-in. two-stage inclined belt conveyor to the mill building for final sizing and washing. These conveyors have 330- and 90-ft. centers respectively. Provision is made to split the



A general view of the stone plant facilities beyond the surge pile. On the left is the building housing the two 4¼-ft. cone crushers, on the right the auxiliary crushing station (shown here under construction), and in the background the finish mill building.



Left: One of the 5- by 14-ft. 2-deck screens in the finish mill building. All of the screens in this building are operated wet, and fitted with perforated screen cloth.

Right: Stone sand is processed in a pair of 12-ft. dia. scoop-type washers, one of which is shown here; it is mounted on top of a 75-ton steel tank.

scalping screen throughs in any ratio desired, depending upon the demand for the road base material.

Mill Building As mentioned earlier, the mill building is laid out on a dual basis, with six pairs of parallel screens arranged symmetrically about the center-line of the long axis of the building, and with a sand washer at each end. Two main delivery belts enter the plant (from opposite ends)—the one already referred to and the other originating from a recrushing station consisting of two Symons 3-ft. shorthead cone crushers. Each of these main conveyors can feed to one pair of screens or to a 30-in. by 44-ft. belt conveyor or to both. The short conveyor in turn transfers the material to a feed box ahead of two of the other pairs of screens. Thus, material coming from either side of the plant (*e.g.* from the 4¼-ft. cones or the 3-ft. cones) can be split up to six ways by being directed to anyone or all of three pairs of screens. This is one of the basic features providing ultraflexibility in the operation.

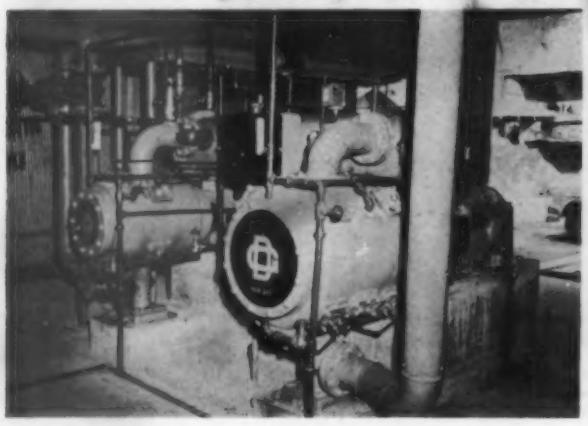
The main screening station is also symmetrical with respect to the short axis of the mill building. In each of these halves of the building there are six screens which discharge their product to a set of four concrete bins.

All of the vibrating screens are two-deck units, fitted with water spray bars. Eight of these are 5 by 12 ft. in size, and four are 4 by 10 ft. in size. (The latter are Cedarapids.) Cross perforated screen cloth is used on all the screens.

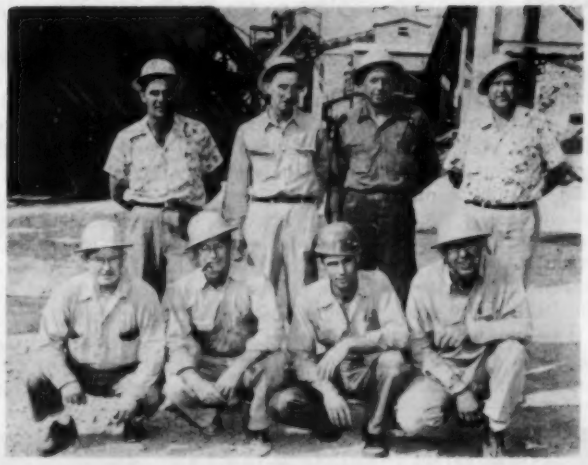
In one half of the building (north half) there is one pair of Allis-Chalmers Lowhead units and a second pair consisting of an A-C Ripl-Flo and a Hewitt-Robins Vibrex. In the south half there are a pair of Hewitt-Robins screens and another pair of Simplicity screens. Oversize from these eight screens (generally plus 1 in., 1⅛ in., or 1½ in.) is scalped off and fed to two 50-ton recrush bins, which in turn serve the two 3-ft. cone crushers. Product off the bottom decks (representing such finished products as 1½-in., 1-in., railroad ballast, No. 3, Class 14, etc., depending upon the screen sizes used) is directed to four 100-ton bins. The undersize coming through the bottom decks (varying from minus ½-in. to minus 8-mesh, again depending on screen sizes), is fed to the Cedarapids screens, where the finer aggregates are sized. Generally the top decks of the latter screens merely serve as relieving decks or are not used at all; therefore these screens turn out only one finished product (off the bottom deck), which is directed to two 50-ton bins. The fines passing through the bottom decks are flumed to a pair of Dorr type BA 12-ft. dia. scoop-type sand washers—one to each half of the plant; these units, which both wash and dewater the fines, produce screenings, concrete sand, or mason's sand. The finished product is then fed to a steel 75-ton tank located beneath each washer.

Right: General view of the finish mill building. The sand tank and sand washer are in the foreground. The blending belt conveyor on the right leads to the tertiary crushing stations.

Below: A central air compressor station, equipped with a 2-stage duplex unit, supplies 1,500 c.f.m. for various plant operations.



All of the storage bins are aligned over a single rail track. In addition there are side chutes which permit truck loading. The bins are also served by a 36-in. by 310-ft. blending belt conveyor which parallels one side of the mill building, and a 24-in. by 40-ft. reversible belt conveyor used in the recrushing circuit. The latter belt is reversible, so that material from four of the plant bins, including the recrush bins, can be fed to either of the 3-ft. cones; this is particularly advantageous when one crusher is down for repair. A two-stage 24-in. belt conveyor, consisting of 210-ft. and 100-ft. centers respectively, returns the cone crusher product to the mill building.



Supervisory personnel shown here are (left to right, kneeling): G. Walker, mill foreman, 2nd shift; C. A. Bland, quarry foreman, 1st shift; E. L. Edwards, mill foreman, 1st shift; and O. R. Kelley, maintenance superintendent. Standing, left to right: Grover Suttle, superintendent, 1st shift; Chris Delaney, superintendent, 2nd shift; Jim Leyton, drill foreman; and Howard Wise, quarry foreman, 2nd shift.

Auxiliary Crushing Station Besides serving as a blending belt conveyor, the 310-ft. belt previously mentioned also delivers coarser material (including stone from the two recrush bins) to the tertiary crushing station (*e.g.* the two 4¼-ft. cones) or to the auxiliary crushing station referred to earlier. At the latter station the stone passes from a transfer tower to a Symons 4-ft. shorthead cone crusher, then *via* a 60-ft. bucket elevator to a pair of Allis-Chalmers 4- by 10-ft. 2-deck screens. These are operated in closed circuit with the crusher, the oversize being returned *via* a short 24-in. belt conveyor. The two products of the screens fall by gravity to a two-compartment 100-ton steel hopper, which is mounted over the same rail track serving the mill building. Trucks also have access to this bin. As an added means of flexibility, stone from either compartment or from the cone crusher can be recircuited to the mill building *via* a 24-in. by 60-ft. belt conveyor which leads to the plant's main two-stage belt conveyor.

It can be seen from the above discussion that the finish crushing and screening operations can be varied almost infinitely. Product from any bin can go to virtually any of the tertiary and fine reduction crushers. In addition, material from any of these crushers can be joined and fed to any of the screens in the mill building. Coupling these facts with the possibilities of using various cone crusher settings and screen sizes, it is no wonder that Big Rock management can claim, "You name it, we'll make it." In fact, many possibilities have yet to be tried.

Water Supply Water for washing the crushed stone is supplied from a 125-acre artificial reservoir located immediately adjacent to the plant on the west. It is pumped to the plant through a 14-in. pipeline by a battery of three Fairbanks Morse deep well pumps, which have capacities of 2,500, 1,500, and 1,000 g.p.m., respectively. Generally plant requirements can be met by the largest unit, the others serving as stand-by or for use under lesser operating loads.

In order to keep the reservoir from silting up, Big Rock is using a unique method. Instead of permitting the wash water to discharge directly into the pond, the firm has installed a 140-ft. dia. Dorr Torq thickener ahead of the pond. Whereas thickeners are conventionally used to reclaim fines for re-use, this unit scalps off the silt and clay, thereby, clearing the water for re-use in the plant. It is operated in conjunction with an Allis-Chalmers 4- by 5-in. SRL slurry pump, which automatically keeps the clayey underflow to a minimum of 50 percent solids; this waste is pumped to a small settling area adjacent to the 125-acre pond.

The trio of deep well pumps used to supply water for washing. Water is obtained from a 125-acre artificial reservoir.

Conveyors The conveyor frameworks used at Big Rock, of company design, consist of double rectangular steel trusses supported by single 24- by 24-in. concrete piers. An arched corrugated-steel cover is incorporated in the framework to protect the return section of the belt. Walkways (on each side) facilitate inspection.

Drives for the larger conveyors (42- and 48-in.) consist of 50- to 100-hp. motors through Falk or Stephens-Adamson speed reducers. For the smaller belts (36-, 30-, and 24-in.), 5- to 40-hp. motors are used, driving the head pulleys through Dodge Torque-Arm speed reducers.

Electrical Electrical power is received at 2,300 v. and stepped down to 480 v. by a Moloney 3-bank 250-k.-va. transformer. The shovels, all of the crushers except the 3-ft. cones, and the three largest conveyors are operated on 2,300 v., the remainder of plant equipment requiring 480 v. As a means of standardization, Allen-Bradley starters are used on nearly all of the electrical equipment. The 4¼- and 4-ft. cone crushers are driven by 150-hp. induction motors; 60-hp. induction motors drive the 3-ft. cones.

Central Air Compressor Station In order to meet all of the compressed air requirements of the operation, the firm utilizes a central air compressor, supplying 1,500 c.f.m. at 100 p.s.i. The compressor is a Gardner-Denver Model HAB 1015 Size 13½ and 8 x 8 horizontal duplex, 2-stage unit, direct-connected to a Westinghouse synchronous 125-hp. motor. It serves the air hoists on the primary crushers, the air gates on the riprap bins, the cone crusher (where it acts as a coolant), etc.

Market Area The Big Rock plant commands a relatively large service area for a quarrying operation, particularly for such products as riprap and railroad ballast. The former product is shipped (by rail) into the lower Mississippi River basin and the Gulf Coastal states. Ballast is marketed in Arkansas and nearly every bordering state. Aggregates are used locally and in western Arkansas. Approximately 90 percent of the shipments are by rail, the balance by truck.

Two more interesting practices at Big Rock deserve brief mention. One concerns an organization chart displayed in the plant office, which was originally devised when the plant was under construction. It serves as an excellent means of informing the management at all times as to the disposition of every one of its 170 men on the payroll. With construction and production going on at a feverish pace during the early days, the men were constantly being changed to new job locations. The chart aided materially in planning and carrying out the necessary tasks. Construction now over, the chart is still useful, since men can be shifted readily according to production requirements. The various job classifications on the chart include drilling and stripping, quarrying and primary crushing, milling and loading, maintenance, administration, construction, and special; each group is in turn divided into the various shifts.

A second notable feature deals with record keeping. In line with its progressive attitude, the company keeps operating data on every piece of equipment—from shovels down to conveyor belt drives. All repairs, operating time, performance, etc., are diligently recorded.

Officers, Staff C. P. Pesek is president and W. E. Vroman is vice-president and general manager of Big Rock Stone & Material Co.; W. E. Saeler is controller, and J. P. Murphy, sales manager.

Key operating men include T. M. Howell, general superintendent; W. B. Tracy, plant engineer; Grover Suttle and Chris Delaney, assistant superintendents; C. A. Bland and Howard Wise, quarry foremen; Jim Leyton, drill foreman; G. Walker and E. L. Edwards, mill foremen; O. R. Kelley, maintenance superintendent; W. Bolinger, electrical foreman; and Perry Young, construction foreman.

The Big Rock firm also operates a modern ready-mixed concrete plant in Little Rock adjacent to its main office. This plant has a Ransome 3-cu. yd. central mixer. Deliveries are made in a fleet of 33 transit-mixing trucks. Aggregates are brought in by barge from the company's dredging operation (upstream) on the Arkansas River.

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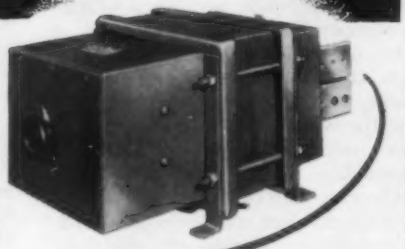

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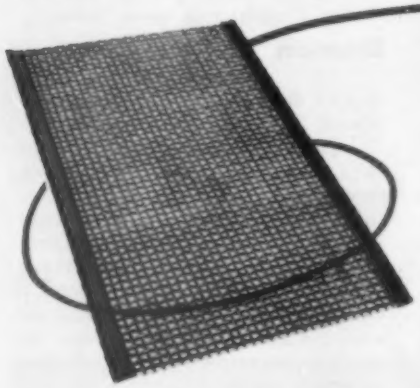

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Washington News Letter

(From page 51.)

payrolls did not rise at all.

In Wyoming agricultural income fell by 27 per cent, far more than the national average, while manufacturing payrolls rose by 12 per cent, slightly above the national average.

On the assumption that favorable economic forces favor the Republicans and adverse economic forces favor the Democrats, these changes in state income payments suggest that the chances of the Republicans are enhanced in Kentucky and Ohio, while the chances of the Democrats are enhanced in Colorado, Iowa, New Mexico, Oregon, and Wyoming. In the remaining states, these economic forces appear to be so divided that they will play no major factor in the election.

How valid this current line of reasoning is, only the tally in November will tell.

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The 4 x 10 double deck Seco vibrating screen pictured above is the only equipment used in preparing this sand for market. Shown here, it is producing about 15 TPH of mason sand and about 15 TPH of concrete sand and could easily double this production, if desired. Like so many other operators, Thompson-Montgomery are more than pleased with the troublefree, efficient performance of this Seco Vibrating Screen. Isn't this what you want on your job? Write, wire or phone.

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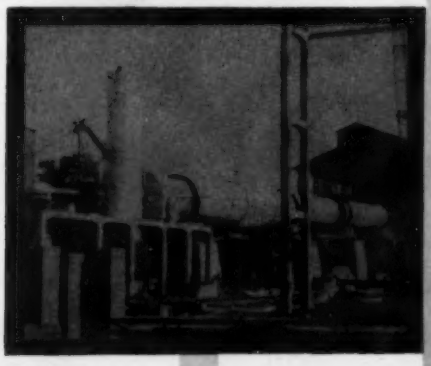

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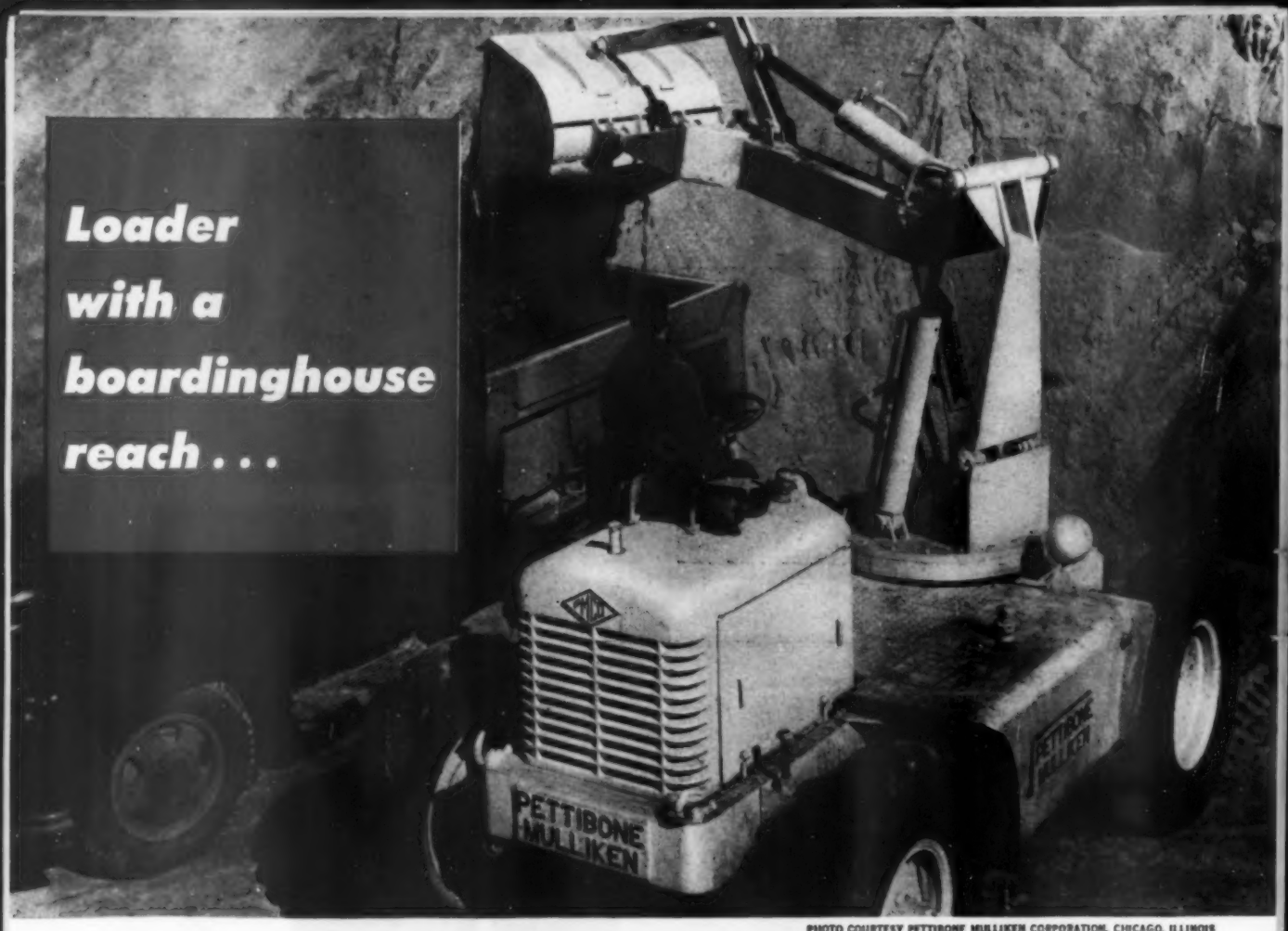

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This versatile, highly maneuverable loader goes after work like a stevedore after "seconds." Boom swings through 180°, loads faster, in less space, to the left or right without moving from its short, single working line. Cuts loading time up to 25%. Bucket, fork, tote hook and backfiller blade attachments are interchangeable.

Torque Converter provides extra power for tough going, faster acceleration *without* necessity of shifting gears or declutching. Furthermore, the Torque Converter eliminates shock loads to the power train . . . thus reduces maintenance.

Pettibone Mulliken Speed Swing Loaders come in two sizes . . . ¾ cubic yard and 1 cubic yard. Both sizes can be supplied with four-wheel drive (like the unit pictured), and four-wheel steer. Chrysler 230 cubic inches displacement Model 30 Industrial Engine drives the ¾ cubic yard unit, and the 265 cubic inches displacement Model Ind. 16 drives the 1 cubic yard unit. Chrysler Torque Converter connects engine with four-speed transmission, transmits power to boom.

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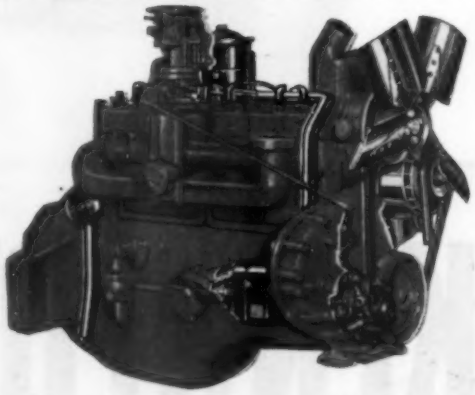

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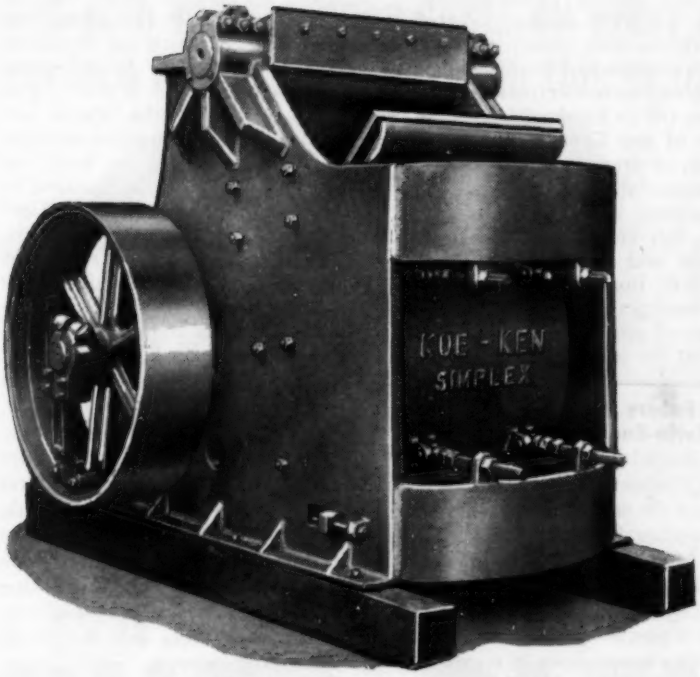

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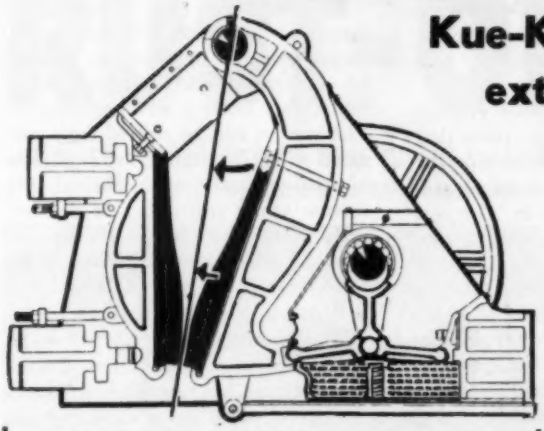

Kue-Ken's "crushing without rubbing" extends life of jaw plates 5 to 10 ⬅ times and uses less power

⬅ See how the Kue-Ken hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing.

★ **CRANKCASE TYPE LUBRICATION**

protects mechanism from wear for the life of the crusher. Kue-Ken is the only crusher whose mechanism operates in a bath of filtered, dust-free oil. Toggles do not wear out. Change oil twice a year.

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Safety Contest Awards

(From page 46)

& Gravel Corp., Smithtown, N. Y., 7,105 man-hours.

Shirey's dredge, C. W. Shirey Co., Cedar Falls, Iowa, 6,880 man-hours.

Alleyton No. 21 wet-pit, Texas Construction Material Co., Alleyton, Tex., 3,430 man-hours.

No. 20 dredge, Lyman-Richey Sand & Gravel Corp., Central City, Nebr., 3,110 man-hours.

Statistics — The safety record of the 165 competing plants was a total of 269 disabling injuries in an aggregate worktime of 12,293,315 man-hours, resulting in a frequency rate of 21.882 injuries per 1,000,000 man-hours. This rate did not compare favorably with the corresponding rates of 221 quarries and 103 open-pit mines entered in the 1953 Natoinal Safety Competition of the Bureau of Mines. These rates in that competition were 10.985 and 12.155 respectively. The total number of days lost due to the 269 disabling injuries at sand and gravel plants was 41,628 resulting in a severity rate of 3.386 days per 1,000 man-hours of work. This rate was less favorable than the respective rates of 2.473 and 1.189 recorded at quarry and open-pit operations in the 1953 National Safety Competition.

Of the 269 disabling injuries at the sand and gravel operations, 6 resulted in death, 4 caused permanent partial disabilities, and 259 caused disabilities of temporary nature. The average severity of all injuries was 155 days and of temporary injuries, 19 days.

Causes of Injuries — Accidents at sand and gravel operations in 1953 involving handling objects, falls of persons, falling objects, haulage, flying objects, and machinery accounted for 186 or 71 percent of all injuries at the participating plants. Injuries which were the most severe occurred in connection with electricity, machinery, falls of persons, haulage, and slides of material. Ninety-four percent of the total days of disability for all injuries was recorded under these five agencies.

At bank and pit operations accidents involving falls of persons and handling objects accounted for 29 percent, equally divided, of all injuries to workers. The most severe injuries occurred in connection with machinery, haulage, and slides of material. Accidents involving these agencies were responsible for all 3 fatal injuries recorded at bank and pit operations.

At dredge plants injuries from handling objects, falls of persons, and falling objects predominated; however, the most serious occurred in connection with electricity. Two of the three workers who were killed in this group were electrocuted, and the other fell to his death.

Rules of the Competition — Any bank, pit, or dredge plant operating an unconsolidated sand and/or gravel deposit is eligible to participate in this competition, which is sponsored and conducted annually by the U.S. Bureau of Mines.

The statistics collected cover all worktime of and injuries to all employees at the plant up to the point at which the sand or gravel loses its identity, as in ready-mix plants, or to the point at which the producer relinguishes control of the raw product.

In each group, the plants are ranked in order of the injury-severity rates. Where there have been no lost-time injuries, they are ranked in order of man-hours worked. All Certificates are Bureau of Mines awards.

Enrollment applications, rules, and information on the Competitions are available, upon request, from the Accident Analysis Branch, Bureau of Mines, Washington 25, D. C.

Euclid Enters New Field With Twin-Engine Crawler

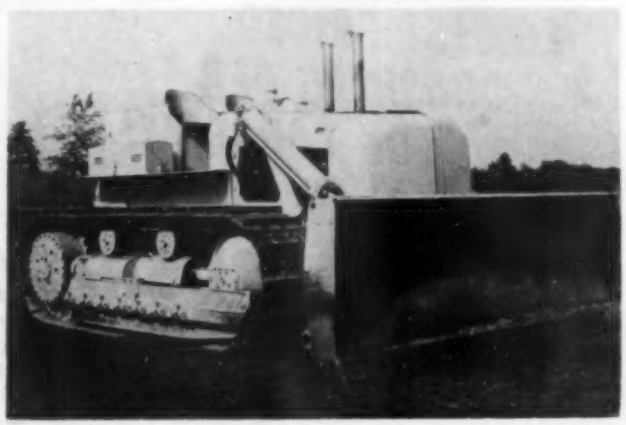
The Euclid Division of General Motors Corporation announced its entry into the crawler tractor market on September 15 with its new twin-engine Model TC-12 twin crawler. The announcement was made by R. Q. Armington, Euclid general manager, at a preview for 450 newsmen, Euclid distributors from 20 countries, and GM officials at the GM proving ground at Milford, Mich., where the 53,000-lb. experimental tractor was put through its paces.

The tractor's two diesel engines develop a total of 380 hp., twice that of any similar equipment now on the market. It will have a drawbar pull of approximately 65,000 lb. The new tractor places Euclid, a leading supplier of off-highway trucks, scrapers, and bottom-dumps in the track-type tractor field. This is a field in which yearly sales of $400,000,000 account for more than half of the total annual earth-moving equipment sold. The new crawler is the first of a projected line of tractors that will meet the requirements for earth moving, open pit mining, logging, and industrial applications Those displayed at Milford are the vanguard of 20 units to be placed in experimental field service.

The Euclid tractor is powered by two 190-hp. GM diesel 6-cylinder engines, each driving an Allison torque converter and torqmatic CRT-5530 transmission. Each drive train independently powers one track. Final drive gearing is the same Euclid planetary used in off-highway 50-ton dump trucks and the 25-yd. bottom-dump wagon.

Each of the two transmissions furnished provides three speed ranges forward and three in reverse. All shifting is accomplished under full power. There is no master clutch. The tractor can be shifted from one speed range to another without loss of motion, and can be shifted into reverse while still going in the forward direction. The transmission provides adequate speed selection for all operating conditions. Top speed is 8 m.p.h.

The tractor was developed through the resources of the Allison, Euclid, and Detroit Engine divisions under the overall direction of C. R. Osborn, GM vice-president in charge of engine group. It will be marketed through distributors of the Euclid Division in addition to its present earthmoving equipment products. No new plants are contemplated.



Euclid's new TC-12 twin crawler, which marks the firm's entry into the crawler tractor market. Powered by two 190-hp. GM diesel engines, each driving one track, the machine has twice the power of any similar equipment.

Cut your maintenance costs on every rustable metal surface indoors and out with this practical, sensible coating!

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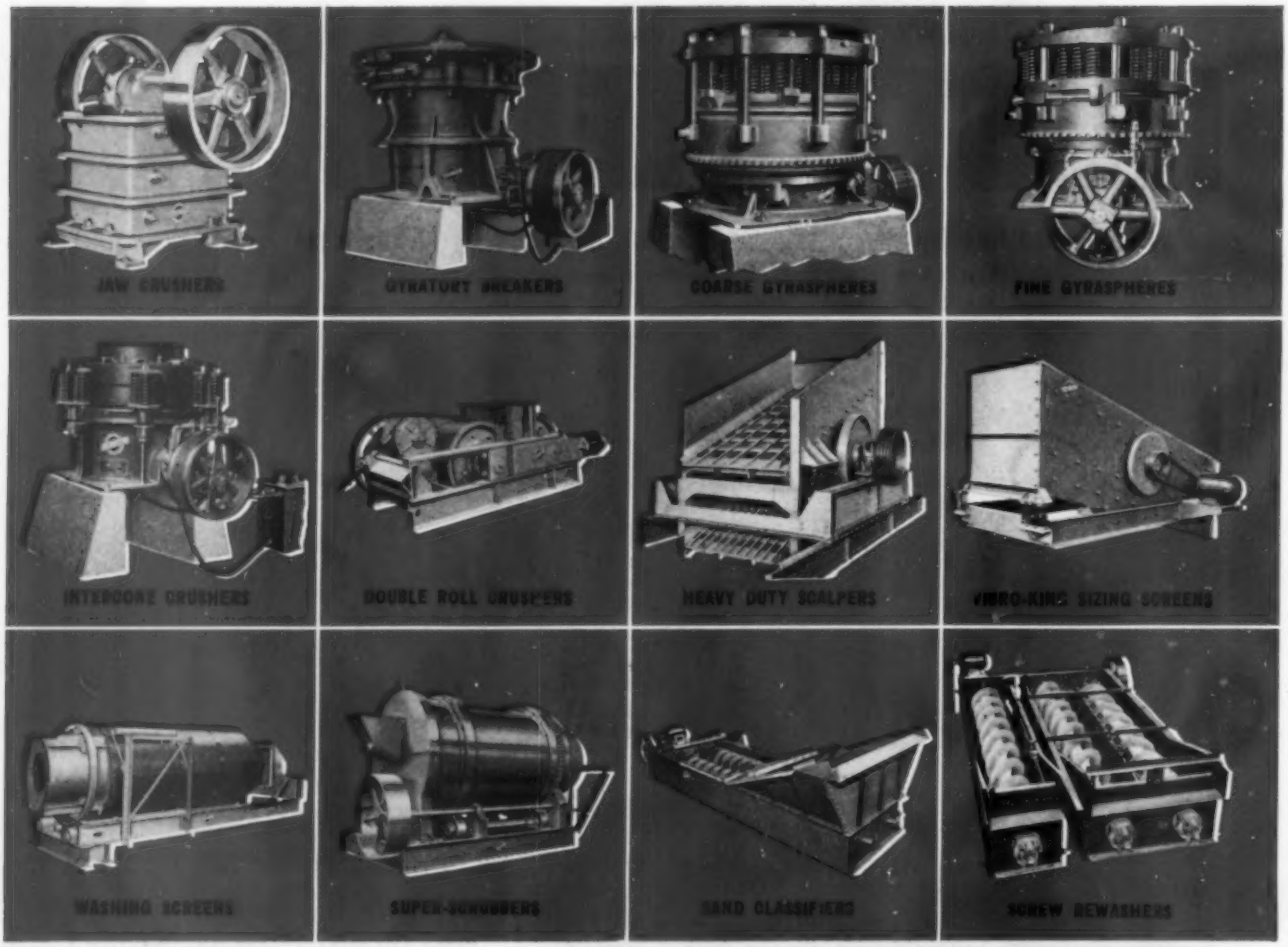

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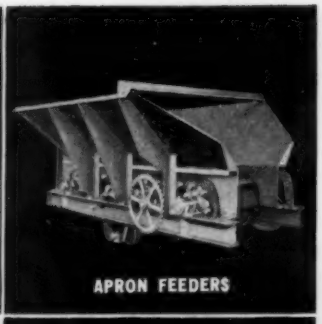

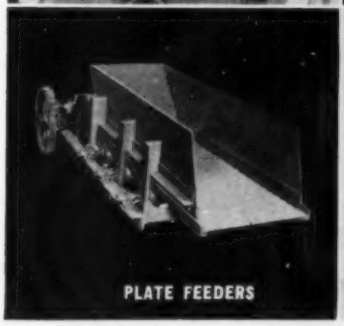

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ON YOUR EQUIPMENT

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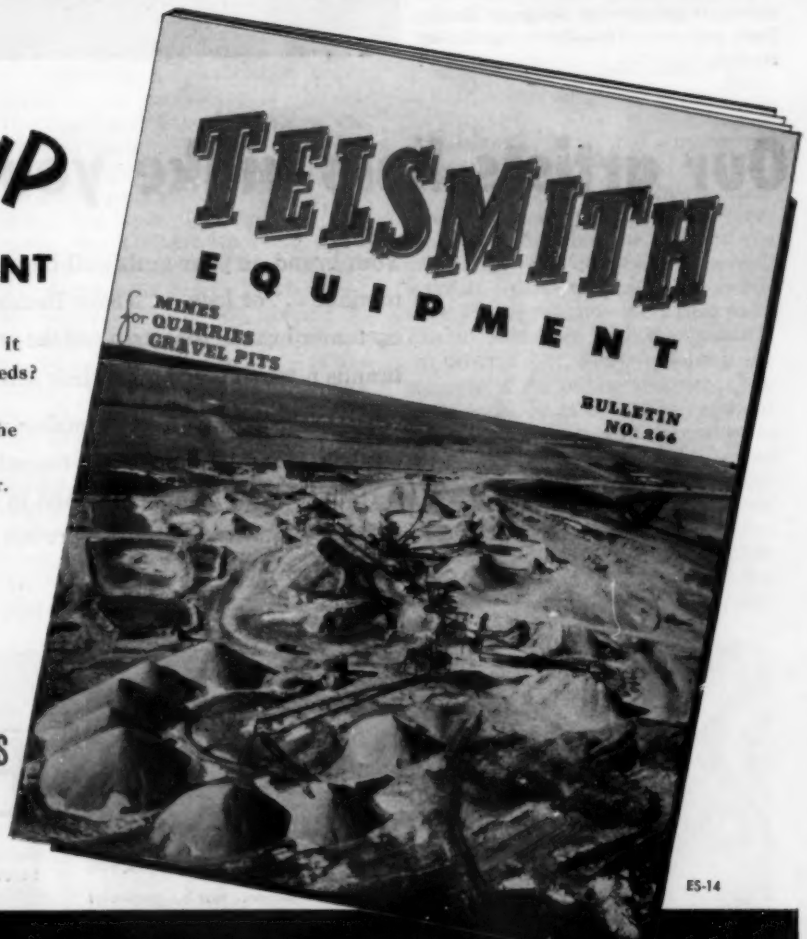

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Directors of N.S.G.A. Meet At Famous Canadian Resort

another ON THE SPOT report

THE boards of directors of the National Sand and Gravel Association and the National Ready Mixed Concrete Association held their joint semi-annual meetings this year on August 25 and 26 at the Manoir Richelieu, Murray Bay, Quebec. From a business standpoint these

By WALTER E. TRAUFFER

were excellent meetings, with record attendance; and much important work was done. It has been the custom in recent years for these meetings to be held at outstanding resorts reasonably accessible to most of the members. The site at Manoir was unanimously voted one of the best selections yet made, combining the luxury of one of the world's finest resort hotels with breath-taking scenic beauty. Preceded by the Saguenay River boat trip, this meeting was one to be long remembered.

Nearly everyone took the entire package tour arranged by the United States Travel Agency. This trip began at Montreal, where board members and their families, totaling nearly 200, boarded the Steamer *Tadoussac* of the Canada Steamship Lines, which also operates the Manoir Richelieu. Leaving Montreal at noon on Sunday, August 22, the boat sailed down the broad St. Lawrence and made an early morning stop on Monday at Quebec for a short sight-seeing tour. That noon it stopped at Murray Bay, where a few additional members came on board. After a late afternoon stop

The Manoir Richelieu at Murray Bay, Quebec, with some of the beautiful grounds surrounding it.

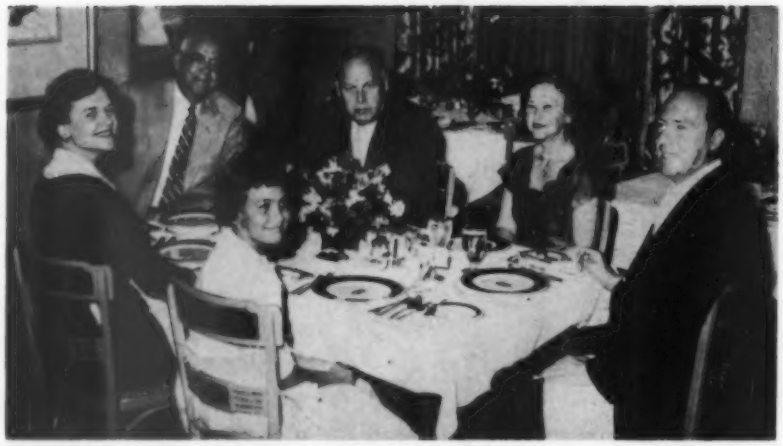
at Tadoussac, a picturesque resort town at the confluence of the St. Lawrence and Saguenay rivers, the trip was continued up the Saguenay to Bagotville, where the boat was anchored overnight. The return trip down the beautiful Saguenay was made on Tuesday morning, and everyone disembarked at Murray Bay shortly after lunch. The facilities for recreation there left nothing to be desired, including a glass-inclosed heated swimming pool and one of the world's best and most scenic golf courses. Friday noon after the meetings were over the boat left Murray Bay for Montreal, arriving there Saturday noon to complete a memorable week.

The N.S.G.A. board met on Wednesday morning, August 25, and the N.R.M.C.A. board met in the afternoon. On Thursday morning a joint meeting was held, followed by a joint luncheon.

President's Address In a brief opening address President John W. Murphy (Union Sand and Gravel Co., Spokane, Wash.) stated that the demand for sand and gravel continued on a high level and that prospects were excellent. He urged, however, that association members and the industry in general put more emphasis on safety and on public relations. The association, he said, was in excellent financial condition. Membership is increasing, but Mr. Murphy urged that all members work to get more producers to join the association, not for increased revenue, which is not needed, but in order to get even more complete representation of the industry. It was also announced that

At the head table were Stanton Walker (N.S.G.A.), President John W. Murphy (Union Sand and Gravel Co., Spokane), and Vincent P. Ahearn (N.S.G.A.).

At this table were Mr. and Mrs. Otto S. Conrades (St. Louis Material & Supply Co., St. Louis, Mo.); and Mr. and Mrs. Frank P. Spratlen Jr. (Ready Mixed Concrete Co., Denver, Colo.)



Mr. and Mrs. Fred E. Bellamy (Concrete Materials & Construction Co., Cedar Rapids, Ia.) and daughter Linda; Mr. and Mrs. Elbert L. Lewis (F. D. Lewis & Son, Inc., Greensboro, N.C.); Robert H. Baker (Dixie Sand & Gravel Corp., Chattanooga, Tenn.).

the association had closed the books on August 1—on its first census of the sand and gravel industry. The percentage of returns was enough for a reasonably accurate estimate of conditions and production in 1953, but better co-operation from the industry is hoped for in the next census.

Future Meetings At the joint meeting of the two boards plans for future meetings were discussed. Louis C. Schilling (I. E. Schilling Co., Miami, Fla.), chairman of the committee on arrangements for the 1955 joint convention in Miami, January 9 to 13, said that plans are well in hand and that there will be ample accommodations for all members and others who wish to attend. Provision has been made for pleasure as well as for business. Registration will begin on Sunday, January 9, Monday will be open, and meetings will begin on Tuesday, January 11. Except for the popular daily open house, evenings will be free. A plant tour for each industry is also planned. There will be no official headquarters hotel, but board meetings and the N.R.M.C.A. Silver Anniversary dinner will be held at the Columbus Hotel. All meetings are scheduled at the recently-completed Miami Municipal Auditorium in Biscayne Park, which is convenient to all the hotels listed.

Places and dates for later joint association meetings, which were decided earlier are as follows:

1956—Chicago, Ill., February 13 to 17, Conrad Hilton Hotel, with joint machinery exhibition

1957—Los Angeles, Calif., February 11 to 14.

For 1958 tentative reservations have been made at the Conrad Hilton Hotel for a joint meeting and machinery exhibition, but invitations from other cities, including New York with its new Coliseum, are being considered. The decision will be made at the Miami convention. An invitation to hold the 1959 joint convention in New Orleans was accepted. Dates for this event are February 15 to 19 inclusive.

There was also considerable discussion of locations for the 1955 semi-annual joint board meetings. Yosemite and Glacier National parks were suggested, as were also the Del Monte peninsula of California, Lake Placid, N.Y., and Hot Springs, Va. The decision was referred to the executive committee.

Percentage Depletion J. Rutledge Hill (Gifford-Hill & Co., Inc., Dallas, Tex.) gave a brief summary of recent developments with respect to percentage depletion. He pointed out that the new Congress may change the picture and urged all producers to continue working to keep the 5 percent they now have and to get it increased to 10 percent.

Vincent P. Ahearn, executive secretary of N.S.G.A., pointed out that sand and gravel at 5 percent is on a par with chemical and metallurgical limestone when used for competitive purposes, but that crushed stone gets 15 percent percentage depletion when in competition with rock asphalt. Producers were also advised to keep delivery costs separate when making their returns, so that they will have the minimum of trouble with tax agents.

Manufacturers' Division Robert P. McKenrick (Blaw-Knox Equipment Div.) gave his report to the board as chairman of the Manufacturers' Division.

At a recent meeting in Chicago the manufacturers' board agreed to locate all manufacturers at the Miami convention in one of two hotels for the convenience of producers. It was also decided to add a third colored badge to identify distributors of the manufacturers. In off years, said Mr. McKenrick, there will definitely be no exhibits, no organized entertainment, and no trips.

Drivers' Manual Executive Secretary Ahearn reported that a survey of the members showed them to be fully in approval

(Continued on page 104.)

Mr. and Mrs. M. G. Kerr (American Aggregates Corp., Detroit, Mich.); and Mr. and Mrs. Ralph H. Anderson (Anderson Concrete Corp., Columbus, Ohio).

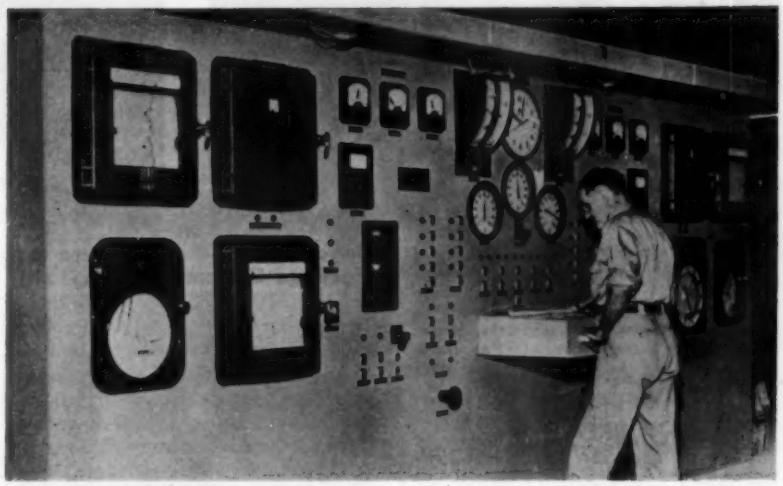
Mr. and Mrs. J. Rutledge Hill (Gifford-Hill & Co., Inc., Dallas, Texas); and Mr. and Mrs. C. A. Barinowski (Montgomery-Roquemore Gravel Co., Birmingham, Ala.)

Application of Electric Drives To Cement Kilns

THE HEART of a portland cement plant is its kiln department. Therefore, the need for continuous, trouble-free operation of kiln drives is of paramount importance.

Because of the high heat inside the kiln, it may become warped by uneven shell temperatures during extended unplanned shutdowns. Kiln repairs are expensive. Lost production time never is regained because burning time cannot be made up in the flowsheet by storage. Many plants provide standby gasoline engines for possible power failures.

By A. K. RANEY
Application Engineer
Industrial Engineering Section
General Electric Co., Schenectady, N.Y.



A modern kiln department burner deck panel. All kiln functions are indicated and/or regulated here.

WHY AN ADJUSTABLE SPEED DRIVE?

There are many variable factors, such as atmospheric pressure, heat content of fuel, composition of raw material from day to day, rate of production, the time the raw material is exposed to fusing temperatures, etc., all of which influence the proper burning of cement. Because some of these are not readily and economically controllable, compensation usually is made by adjusting the time that the material is in the kiln, and this is done by speed adjustment.

The range of adjustable speed usually is dictated by such factors as plant operating technique, the extent of the mechanical apparatus and controls, and the type of cement being produced. This fact explains the variety of types of adjustable speed drives which now are being used on kilns, *i.e.*, d.-c. adjustable voltage, constant potential d.c. with field control, brush shifting a.-c. motor, multispeed squirrel-cage induction motor, magnetic coupling with a.-c. motor, and wound-rotor induction motor. Which drive should the purchaser buy?

LOAD CHARACTERISTICS

The kiln load is comprised largely of continuously raising and tumbling, or cascading the charge, plus bearing and tire friction. Throughout the life of the kiln the aging effects of possible warpage, bearing wear, etc., have been found by operating experience to cause the average starting torque and running torques to increase gradually, although not necessarily at the same rate. For this reason, the drive may not draw full horsepower when it is new. The kiln motor horsepower size is specified by the kiln builder.

Firing practice usually requires approximately constant material feed per kiln revolution. The evidence now on hand indicates that both the cascading and the friction torques are essentially independent of speed, and therefore the drive is nearly constant torque throughout the usual speed range.

Breakaway torque usually is specified as 200 percent on modern kilns, based on the torque at top rated motor speed. Occasionally a higher percentage is requested, and this point should be checked with the kiln builder.

Nonreversing operation is typical, although occasionally operation in reverse direction at very low speed is desired for maintenance purposes.

Rarely is the speed range more than 4:1, although it is desirable to have a large number of speed control steps. Some operators desire preset speed control features, so that operating speed may be resumed with the minimum of delay after a short shutdown.

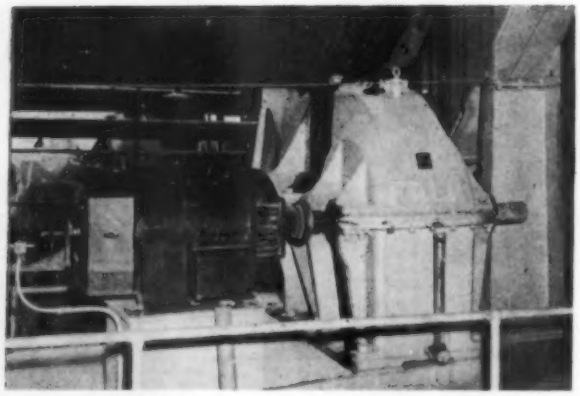
Depending upon the mechanical arrangement, the motor may be only a few inches from the hot kiln shell, or it may be farther away. Sometimes heat insulating baffles are desirable to shield the motor from radiant heat. In many cases the convection air current sweeping up around the hot kiln shell may sufficiently carry away the heat to maintain ambient temperatures in the order of 40 deg. C., which is the standard ambient temperature for Class A insulation.

EQUIPMENT ENCLOSURES

Control enclosures are recommended to be NEMA Type 1A dust resistant, which essentially is only the addition of a gasket to the doors of the standard NEMA Type 1 general purpose enclosure. Dust-tight NEMA Type 5 occasionally is requested. However, experience has shown that sometimes maintenance people are not inclined to close securely the many fasteners of the NEMA 5 doors, so that this higher-priced protection tends to be wasted. The modern trend is toward placing major control components, such as group controls and switchgear, as well as MG sets, in rooms pressure-ventilated with filtered air. Sometimes this room may be located within one of the kiln piers. In that case, NEMA Type 1 general purpose enclosures should be adequate.

Notwithstanding the dustiness of cement plants, the modern practice is to use dripproof motor construction. Totally enclosed unit-cooled motors are available and sometimes may be used, but as a general rule the dripproof type is considered adequate for this application, with the added benefits of simplicity and lower cost. The cement dust, which is largely nonconductive, may pass through the machine or be blown out occasionally by compressed air.

Wound-rotor 30-hp. 7 r.p.m. gear motor driving a rotary cement kiln pinion directly through flexible coupling. The power selsyn transmitter coupled to the kiln motor is electrically synchronized with the power selsyn feeder. The tachometer generator is for speed indication on the burner deck panel.



A d.-c. adjustable-voltage 125-hp. motor driving a kiln through a gear reducer. The motor-mounted tachometer generator is electrically connected to the kiln speed indicator on the burner deck panel.

DRIVE

We will discuss in turn the following drives (see Figure 1) which are being used:

D.-C. Drives

1. Ward Leonard adjustable voltage
2. Constant potential d.-c. with field control

A.-C. Drives

3. Brush shifting motor
4. Multispeed squirrel-cage motor
5. Magnetic coupling and squirrel-cage motor
6. Wound-rotor induction motor.

Comparison generally will be referred to the adjustable voltage system because at the present time that one offers the most advantages for kiln drives.

Adjustable Voltage Basically the adjustable voltage system is composed of a d.-c. kiln motor, an a.-c. d.-c. conversion power supply, and suitable control devices. (See Figure 1.)

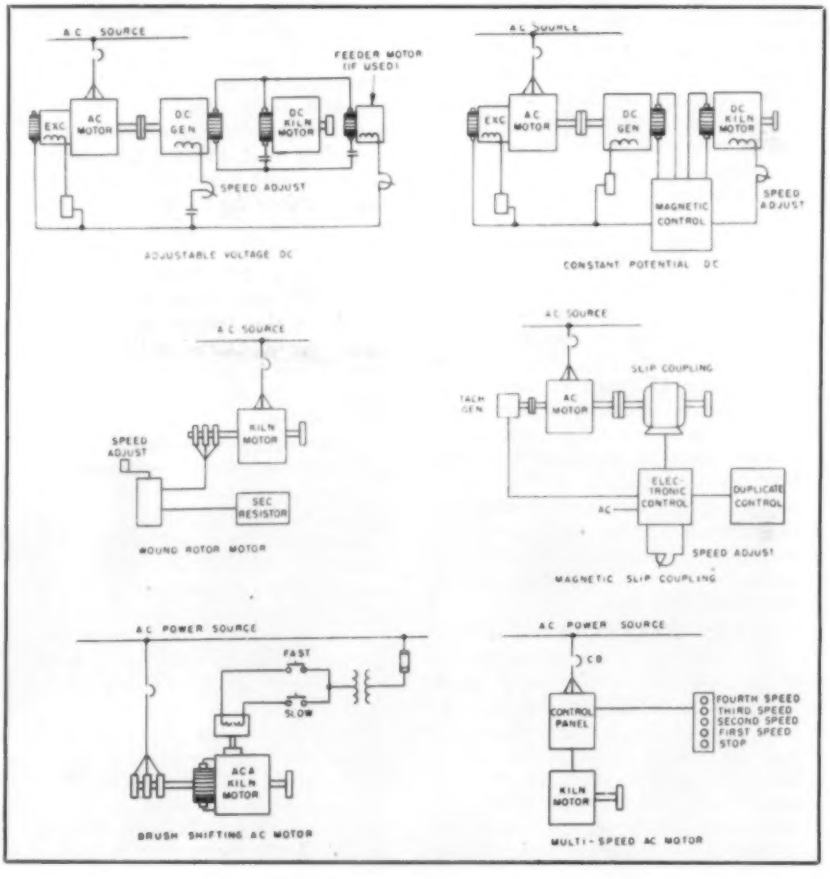
With contsant field excitation the kiln motor speed is proportional to the applied armature voltage. Therefore, speed adjustment is accomplished by adjusting this voltage by means of the generator field rheostat. This rheostat, together with the START-STOP pushbutton station for the kiln motor, is located on the burner deck panel at the firing end of the kiln. Here the operator may observe the burning process and make required changes in kiln speed.

An air cirucit breaker frequently is used in the dual role of short circuit protection and MG set motor starter because of the small number of starts per year.

Separate or Package Equipment There are available two kinds of motor-generator adjustable voltage drives: one, the separate equipment drive, consisting of separate kiln motor, separate MG set, and separate control; the other, the package type such as Speed Variator*, having the MG set and the control pre-engineered. The MG set is mounted inside a self-supporting sheet-metal enclosure. The price of this pre-engineered package usually is lower than the separate equipment.

* Registered trade mark.

Figure 1—Various types of kiln drives.



One might well ask, "Why two adjustable voltage equipments?" The kiln motor in each case can be the same. The difference, then, lies in the power unit, specifically its temperature rating and service factor. Conventional package power units usually are rated 50 deg. C. rise, 1.00 service factor. Separate standard equipment MG sets are rated 40 deg. C. rise, 1.15 service factor. The choice rests with the purchaser,

although many kiln operators prefer 40 deg. C. ratings for increased margin.

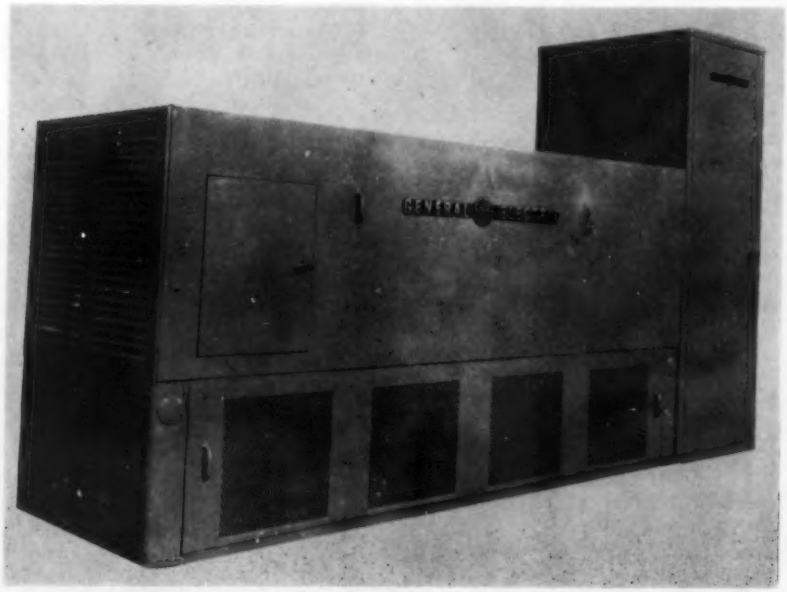
Unless the power supply is to be located in a clean separately ventilated room, the separate equipment MG set will be subject to considerable cement dust. The package power unit has the benefit of its own filters; however, it must be emphasized that these filters will require good maintenance for successful operation in dusty locations.

Performance Adjustable voltage kiln drives have given excellent performance. They have suitable starting torque, good regulation, smoothly adjustable speed over a wide speed range, and they are familiar to maintenance people. D.-c. machines have proven reliability in cement-dust atmospheres.

Their efficiency is greatly superior to magnetic couplings and wound-rotor moter drives at reduced speeds; it is somewhat less than the brush shifting motor and the multispeed squirrel-cage motor because of the extra machines involved.

Feeder Motor Co-ordination A d.-c. feeder motor may be co-ordinated conveniently with kiln speed by operating it electrically in parallel with the kiln motor. (See Figure 1.) Furthermore, the control can also be arranged to allow independent feeder operation and control. The feeder motor field rheostat can be adjusted to trim the feeder speed properly during setting of the burning cycle or while operating, as the need may arise.

The kiln power room, located beneath the kiln drive pier, showing two 125-kw. 230-volt d.c. MG sets, control panels (far end), and 1000-kv.-a. load center unit substation feeding kiln MG sets and other kiln department loads.



Package type adjustable-voltage d.-c. power unit typical of the 75-200 hp. sizes; control panel is at the right. Three intake filter openings are shown at the bottom. Exhaust louvers are at the left end.

Multi-unit MG Sets In cement plants having a large number of kilns several adjustable-voltage kiln generators may be driven by a common a.-c. motor at some cost saving. For example, about 10 percent may be saved by this means over the use of three separate 100-hp. equipment drives. However, it should be kept in mind that this saving can easily be eaten up by the reserve capacity which may be required for the sake of reliability; otherwise, outage of the multi-unit MG set would shut down all three kilns.

The modern practice is a unit drive for each kiln, much the same as unit pulverizers are modern firing practice.

Constant Potential D.-C. Basically, this drive consists of a tapered horsepower d.-c. kiln motor, a constant potential d.-c. source, and suitable starting panel. (See Figure 1.) Contrary to the adjustable voltage system, the armature voltage is constant and the speed is adjusted by changing motor field current. Both the start-stop pushbutton for the motor starter and the speed adjusting field rheostat usually are mounted on the burner deck panel.

From the performance standpoint, a field-controlled d.-c. drive is a good reliable one having adequate starting torque with full field, comparatively flat speed torque curve and therefore reasonable regulation at running speeds. However, there are some other factors to consider before selecting this drive.

D.-C. Bus Perhaps the majority of field-controlled drives are operated from d.-c. buses, particularly in old plants where large d.-c. distribution systems were more common than they are now. If spare constant potential conversion capacity is available in a plant or if a constant potential drive is to be replaced, the natural tendency may be to continue to add or to replace constant potential drives, especially since the motor and control (by themselves) cost less than the adjustable voltage drives with MG sets. (See Figure 2.) However, considerable evidence indicates that existing constant potential d.-c. power distribution systems should not be expanded.

It might be added that it is not always necessary to buy new kiln motors if it is desired to convert from constant potential to adjustable voltage because constant potential motors can be used in adjustable voltage systems.

Separate MG Sets Occasionally a kiln operator may desire to have a constant potential drive with separate MG set; however, it can be seen from Figure 2 that this usually is not economically justified.

Common Generator By employing one constant potential generator to supply three field-controlled kiln motors, some saving in first cost can be made over three separate constant potential MG sets and kiln motors, for instancee approximately 5 percent in the 100-hp. size. Outage of the common MG set would shut down all three kilns. Aside from the reduced reliability of such a scheme, it usually will be from 10 to 20 percent more expensive than three separate adjustable voltage drives.

Brush Shifting ACA Motor The ACA motor is an adjustable speed drive which operates directly from the a.-c. power lines without conversion equipment. (See Figure 1.) It therefore takes less total floorspace and effort to install than d.-c. drives with MG sets. It is inherently a constant torque machine having reasonable speed regulation over the speed range and better efficiency than d.-c. drives.

Smooth speed adjustment may be made by shifting the motor brushes. Usually operators prefer to change speed by means of a brush shifting pilot motor which is controllable from a fast-slow pushbutton on the burner deck panel. The START-STOP pushbutton also is located there. At present the domestic brush shifting ACA motor is available up through 150 hp. Coordination of a brush-shifting feeder motor can be accomplished by a small gang rheostat which adjusts both kiln and feeder pilot motors simultaneously.

Four-Speed Squirrel-Cage Motor Basically this drive is four squirrel-cage motors rolled into one. This is accomplished by multiple stator windings which are externally connectable to the different speeds by means of contactors and suitable control.

Speed change is made by means of a pushbutton for each speed plus a STOP button, all mounted on the burner deck panel. (See Figure 1.) Standard high-torque designs have 200 percent starting torque only on the low-speed connection. Therefore, the control should be arranged so as always to start on the low speed and accelerate in definite time steps to the speed corresponding to the pushbutton which has been selected. Deceleration to lower selected speeds may be arranged in a similar manner.

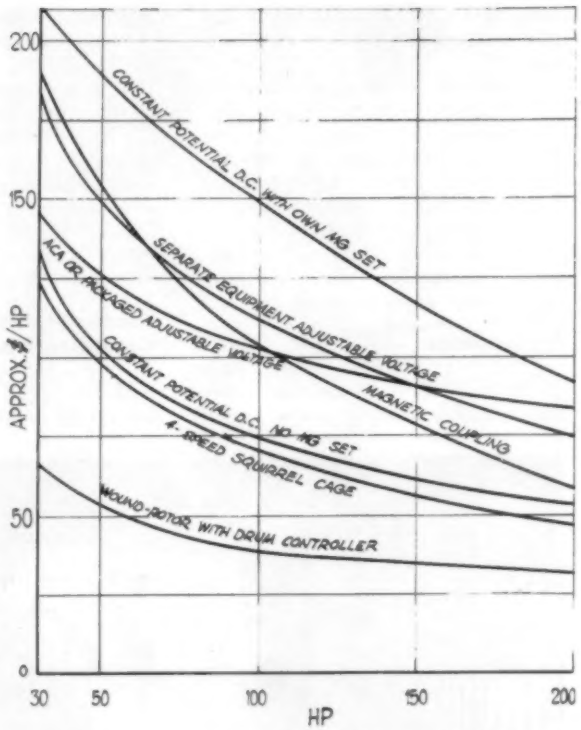
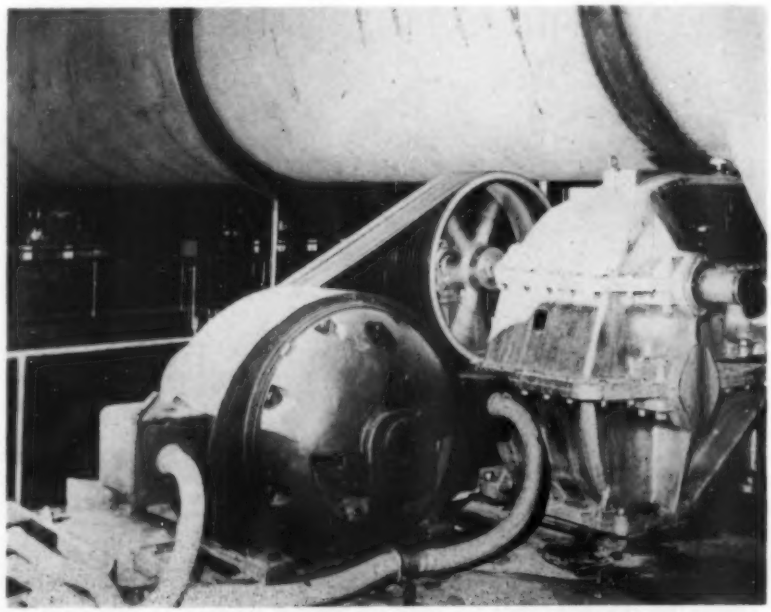


Figure 2—Adjustable-speed kiln drives—no feeder motor.

Performance When the burning techniques are such that a relatively few constant speed points can be tolerated, this medium-priced drive is a good one. It is probably in in the minority of installed drives, however, because of the inflexibility of speed adjustment and the lack of inherent feeder co-ordination means. The KG high starting torque design has adequate starting torque and comparatively good regulation and efficiency. It is inherently a pre-set speed controlled drive when used with selective pushbuttons for each speed, may be operated directly from the a.-c. line without conversion equipment, and requires relatively small floor space.

Magnetic Slip Coupling and A.-C. Motor This drive for kilns consists of a common base on which are mounted a constant-speed a.-c. motor and a direct-



High-starting torque, 125-hp. multispeed squirrel-cage induction motor driving a kiln through V-belts and gear reducer.

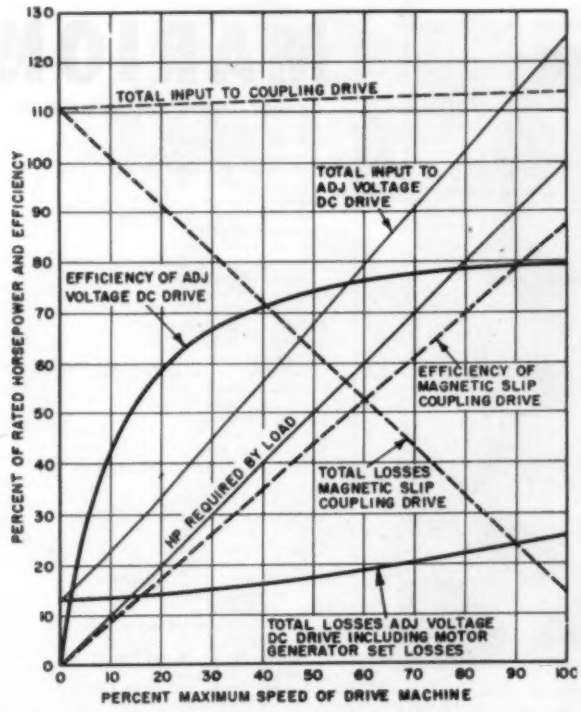


Figure 3—Approximate relationships between magnetic slip coupling and adjustable-voltage d.-c. drives. Constant torque over speed range. Wound-rotor drive has characteristics similar to magnetic coupling.

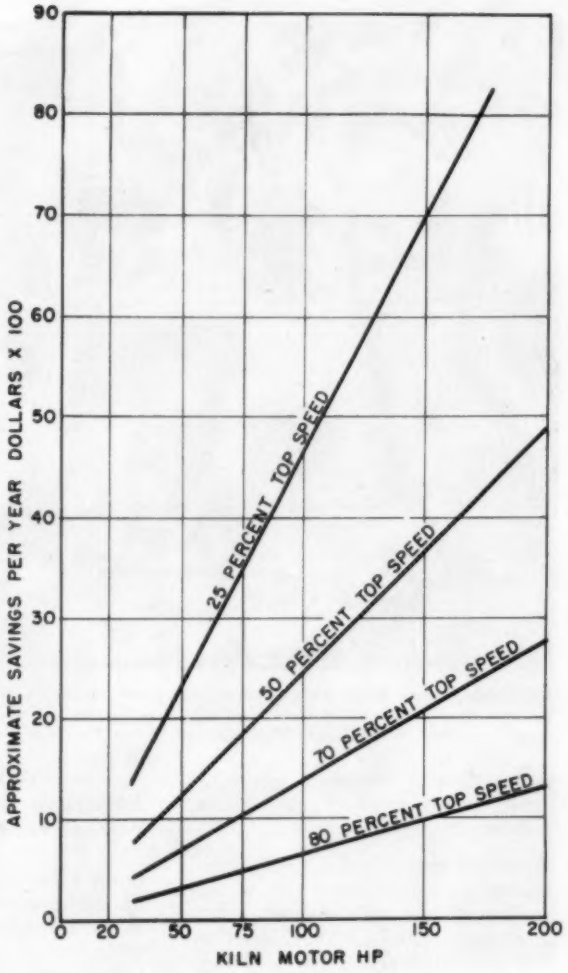


Figure 4 — Approximate saving of adjustable voltage over slip-controlled drive per year of continuous operation. Constant torque. Energy charge is $.01 per kw.-h.

ly connected magnetic coupling. The coupling output shaft usually is directly connected to the kiln drive gear box. Magnet coils on the output rotor are excited through slip rings from an electronic rectifier control panel. The strength of this excitation may be adjusted in order to adjust the output speed of the coupling —speed increasing with excitation. A phaseshifting potentiometer located on the burner deck panel is used to adjust the rectifier output level and thereby the kiln speed.

A comprehensive treatise on magnetic couplings is beyond the scope of this article; basically, however, this drive is a slip-controlled one having basic characteristics similar to the wound-rotor motor, but having stepless speed control throughout a speed range as wide as the Ward Leonard. Similar to the wound rotor, its inherent speed regulation is poor at reduced speeds. Good regulation throughout the speed range is obtained by the addition of tachometer feedback features. With follower control a feeder motor may be coordinated from the same tachometer.

Less total floor space is required than for d.-c. drives with MG sets, although more floor space is required directly beside the kiln than for a d.-c. motor.

A synchronous motor may be used if power factor correction is desired. (This is also true of the Ward Leonard adjustable voltage drive.)

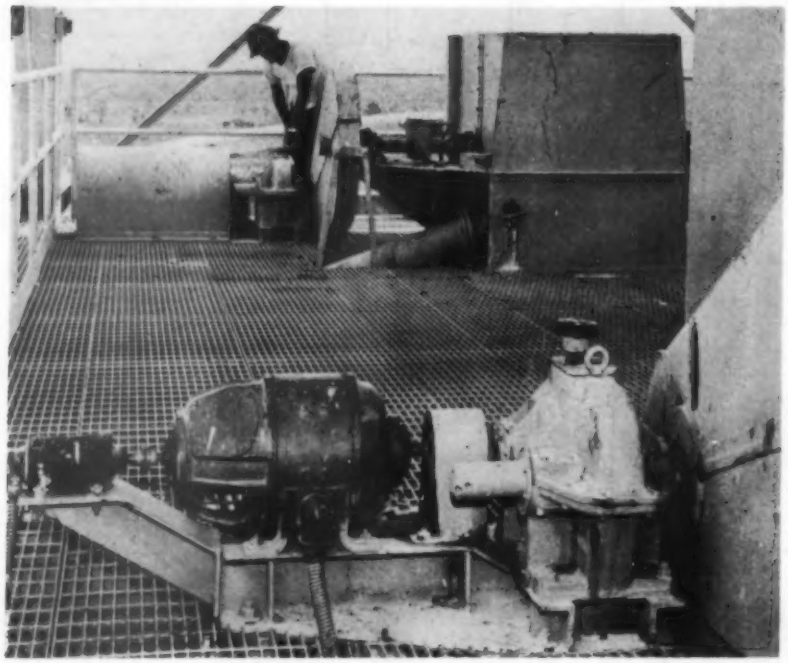
As they are usually applied now, magnetic coupling controls have electronic tubes. Although electronic devices have proved useful on many industrial applications, many cement industry people would prefer not to use them on kiln drives for various reasons, *i.e.*, maintenance personnel may not be familiar with electronic circuits, dust, heat and dirt may be abnormal, lost time costs are high.

Duplicate electronic panels with automatic throwover may be used in order to reduce down time in the event of tube failure. It may be desirable to consider amplistat control instead of electronic control.

In water-cooled magnetic couplings the cooling water usually is intimate with the housing containing the rotating coupling elements, so that water softening may be required, especially because water supplies for cement plants often come from limestone strata. If the water pressure should fail, the coupling may seize within a few minutes and production may be spoiled by improper burning until water pressure is restored. Heat damage to the kiln shell would be avoided because the kiln would be turning at approximately maximum speed. Undoubtedly some maintenance attention would be required on water softening apparatus if it is used.

Magnetic couplings, like wound-rotor mators, have inherently poor efficiency at reduced speeds. Figure 3 shows the approximate comparison between magnetic coupling and adjustable voltage drives. Note that the total input to the coupling drive is essentially constant over the speed range, whereas for the d.-c. drive the total input varies linearly with speed. (Remember, we are considering constant torque.)

Kilns usually will not operate at top rated motor speed during normal burning because some reserve speed is desired for cooling off during unusual heat balance changes. Therefore, although low losses at reduced speeds may not always be a prerequisite in kiln drive selection, never-



Adjustable-voltage 5-hp. 230-volt d.-c. drip-proof feeder motors driving slurry feeders through gear reducers. A direct-connected tachometer generator operates the feeder speed indicator on the burner deck panel.

theless they represent a significant saving over a period of years. Figure 4 shows this.

Wound-Rotor Motor Basically, this drive consists of a slip ring motor, a primary starter, and external secondary resistance grids and controller. Starting and stopping of the drive is done by pushbuttons on the burner deck panel; speed adjustment is made with the drum controller, which is located near or on the burner deck panel.

This is a popular drive with many operators because it is simple, sturdy, reliable, relatively inexpensive in first cost, and familiar to maintenance people. Its soft speed-torque characteristic below top speed limits its speed range with reasonable regulation to approximately 2:1 for this application. Regulation is important because poor speed regulation per kiln revolution causes the hot charge to lie on some elements of the kiln longer than on others, encouraging warpage and making the burning process less uniform.

Compared with some of the other drives, it has relatively few points of speed control with the conventional secondary drum controller and grids.

The wound-rotor motor has equally as poor efficiency as the magnetic slip coupling at reduced speeds and has no inherently flexible method of feeder motor co-ordination such as the adjustable voltage system has.

FEEDER DRIVES

Adjustable Voltage Feeder Operating experience is good on this type of feeder. From Figure 5 it can be seen that the addition of a d.-c. feeder motor to the adjustable voltage kiln drive is less expensive than the other feeders; this is mainly because only a few added control features are needed to co-ordinate it with the main drive. Independent feeder control is possible, in addition to speed matching.

Speed Matching

Because the kiln and kiln feeder motors are widely different in horsepower ratings and may be at different distances from the d-c generator, their circuit IP drops are seldom exactly the same; this means that normal speed matching over the speed range is not inherently so exact as it is with power selsyn feeders, for instance. However the discrepancy usually is not great enough to be considered objectionable.

Magnetic Coupling Feeder An air-cooled magnetic coupling and an a.-c. squirrel cage induction motor drive may be co-ordinated with the kiln motor by means of an electronic panel with tachometer follower features. For this reason, speed matching is likely to be more exact than it is on adjustable voltage feeders,

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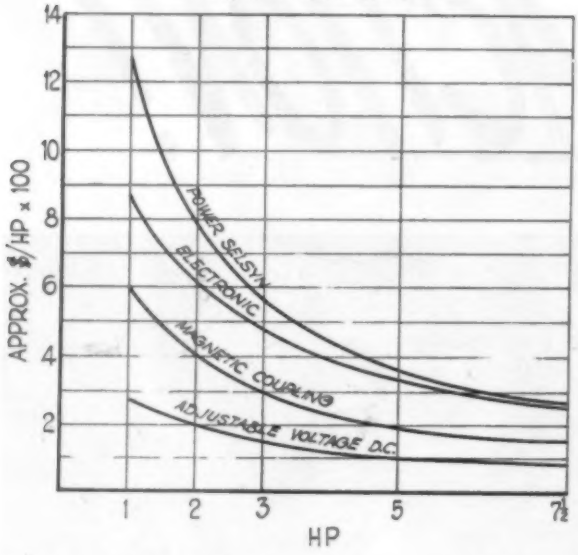
Figure 5—Kiln feeders.



but here again electronic devices may be involved.

Power Selsyn Feeder The power selsyn feeder system consists essentially of a wound-rotor type transmitter driven by the kiln motor, having its secondary electrically connected to a similar machine which drives the feeder mechanism as a motor. (See Figure 6.) This drive has worked well and is used in many cement plants.

Although exact synchronism is obtained between the kiln motor and feeder by using this system, it is less flexible than some other systems unless it is equipped with adjustable ratio pulleys, or equivalent. After being shut down for any reason the power selsyns cannot be resynchronized without first stopping the kiln.

Electronic Rectifier This drive consists of a d.-c. feeder motor and an electronic adjustable voltage power supply. (See Figure 7.) For reasons previously mentioned, the electronic tube rectifier controlled drives are not so frequently used here as some other drives. However, the d.-c. motor performs well here, and close speed matching with the kiln motor is obtained by using tachometer follower features.

Mechanical Feeder Drive Chain drive from the kiln motion sometimes is used but is relatively inflexible during kiln operation unless adjustable ratio pulleys or other mechanical devices also are used. Otherwise the feeder mechanisms (*i.e.* buckets on the slurry feeder) or sprocket sizes must be changed in order to change the speed relationships.

SUMMARY

Adjustable Voltage Ward Leonard kiln drives are outstanding in proven reliability and performance. Either separate equipment or package-type drives are available. D-c. feeder motor speed may be co-ordinated with kiln speed.

Constant Potential D.-C. The field-controlled drive is a good, proven, reliable one, but the over-all plant power system should be considered before this drive is selected. Feeder co-ordination is not so convenient as on adjustable voltage system.

Brush Shifting A.-C. Motor The ACA motor operates directly from the a.-c. line without conversion equipment; so it requires relatively small total floor space. It has stepless speed adjustment and operates well in relatively clean plants. Feeder co-ordination is not so convenient as on the adjustable voltage system but can be easily arranged.

Multispeed Squirrel-Cage Motor This is a simple drive which is good when burning technique can tolerate four definite speed points only. It operates directly from a.-c. lines without conversion equipment.

Magnetic Slip Coupling This slip-controlled drive has nearly stepless speed control and with tachometer feedback gives good regulation over the speed range. Duplicate electronic control panels are required for reliability. Water softening equipment may be required. Efficiency is poor at reduced speeds. Electronic feeder drives may be coordinated conveniently with kiln speeds.

Wound-Rotor Induction Motor This is the least expensive drive in all horsepowers and is a good one for kilns which are expected to operate near top speed most of the time, or where burning techniques permit some speed changes per revolution at reduced speeds due to possible uneven kiln torque requirements per kiln revolution. Its stable speed range is limited to approximately 2:1. Efficiency is poor at reduced speed. Feeder co-ordination is not so convenient as on adjustable voltage.

Conclusion As the foregoing discussion indicates, there are several kinds of electric drives which have been successfully applied to cement kilns. Therefore, a generalization such as the following may be of benefit to the reader: If it were required to specify a kiln feeder drive, not having any specific knowledge about the plant location or conditions, etc., an adjustable voltage drive could be confidently specified. At the present time this drive is the most universally satisfactory and offers the most benefits to the user. By considering all factors in a given kiln drive situation other types may prove equally suitable.

The following information is pertinent in selecting a proper drive:

1. Kiln motor horsepower and speed range.
2. Feeder motor horsepower and speed range.
3. Average normal operating speed, percent of top rated.
4. Starting torque, if greater than 200 percent.
5. Ambient conditions: dustiness, temperature, indoors, outdoors, etc.
6. Auxiliaries: speed indication, holding brake, sliding base, etc.

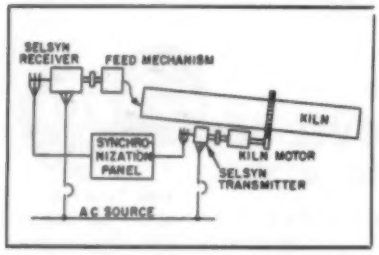


Figure 6—Power selsyn feeder.

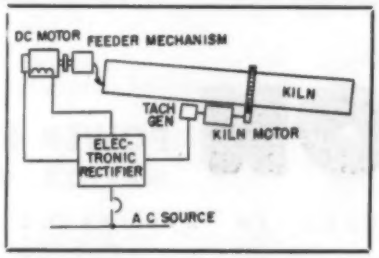


Figure 7—Electronic rectifier feeder.

Vibration Can Produce
Insurance Subrogation Problems
*For Quarry Operators**

By WARREN C. ROWE
Rowe Contracting Company
Malden, Mass.

IN the normal conduct of blasting operations by quarry owners it is not uncommon to find local residents complaining of ground vibrations and claiming damage to their homes.

Many of these complainants carry fire insurance on their homes with an extended coverage endorsement protecting them from direct loss by windstorm, hail, explosion, riot, riot attending a strike, civil commotion, aircraft, vehicles, and smoke.

The word "explosion" in the above creates a problem for the nearby quarry operator far greater than the everyday handling of explosives in his pit. The word "explosion" permits the policyholder to claim payment for alleged damage to his home, based on the normal activity of the nearby quarry.

All too often the adjuster, not at all versed in the modern quarry method of drilling and blasting, will pay the householder $100 or more without the slightest attempt to consult with the quarry operator and learn the merits of what took place. Then the insurance representative secures the policyholder's signature of assignment and starts proceedings against the operator for reimbursement of the money paid the homeowner. This legal step is known as "subrogation".

Quarry owners are recognizing the growing evil of "subrogation" and are beginning a campaign to educate the insurance world along the lines of present-day controlled blasting. With so much technical progress in the use of explosives during the past 14 years, quarry operators working hand in hand with the powder manufacturers are confident of what they are doing. They are mighty sure that an explosion set off deliberately in a quarry is not an accident or a catastrophe. Vibration originating from a quarry blast and felt at a distance from the impact which gave rise to it is quite different from an explosion, as generally understood.

Quarry operators do not think any money should be paid through insurance companies on the basis of the extended coverage clause. They believe that claim agents and adjusters should be educated to recognize the modern methods of blasting and the high degree of vibration control that exists.

The pre-determined amount of vibratory disturbance which all building materials can withstand is the foundation of all building codes, and is familiar to building contractors, architects, and engineers generally. The United States Bureau of Mines has compiled tables indicating what may be expected from the discharge of specific amounts of powder at definite distances under varying conditions of terrain. Quarry blasting is currently carried on with the same precision of measurement that makes possible all our present-day mass production in the industrial world.

The insurance people up to the present time have not generally recognized this, and the quarry people are convinced it is high time they did.

Not only has the United States Bureau of Mines reached specific conclusions in this field of vibration, but the interpretation of the effects of millisecond-delay blasting, a postwar introduction, has led to specific and highly favorable conclusions held by such men as Dr. L. Don Leet of Harvard University, Father Birkenhauer of John Carroll University, Rev. Daniel Linehan of Weston College, F. J. Crandall of the Liberty Mutual Insurance Company, and many others.

Although it is chiefly the fire insurance companies with whom the quarries are at loggerheads, it is significant that the casualty companies are gradually expanding into the fire coverage field. Thus, when a casualty company insures a quarry operator, it is interesting to observe that the same company may find itself on both sides of a vibratory problem if it is at the same time insuring a nearby householder for fire, plus extended coverage.

Some casualty companies, however, have engineering departments which have explored the degree of vibration emanating from blasts and know the limits and control which today exist in the rock extraction industry. This is, indeed, an encouraging sign to quarry people; it is even more so when a close inspection of structures is made prior to extending coverage.

Still another step forward has been accomplished in the state of New Jersey, where the new quarry regulations contain a section which sets up a table of maximum amplitude in inches under specific quantity and frequency-of-vibration conditions. Blasting operations falling within this table are considered by the state authority not to cause even the most minor damage to structures.

The existence of this section in the state of New Jersey regulations should give adjusters real food for thought in responding to claims of vibration damage in the vicinity of New Jersey quarries.

It is possible that after further study the state of New York may incorporate in its regulations a similar section.

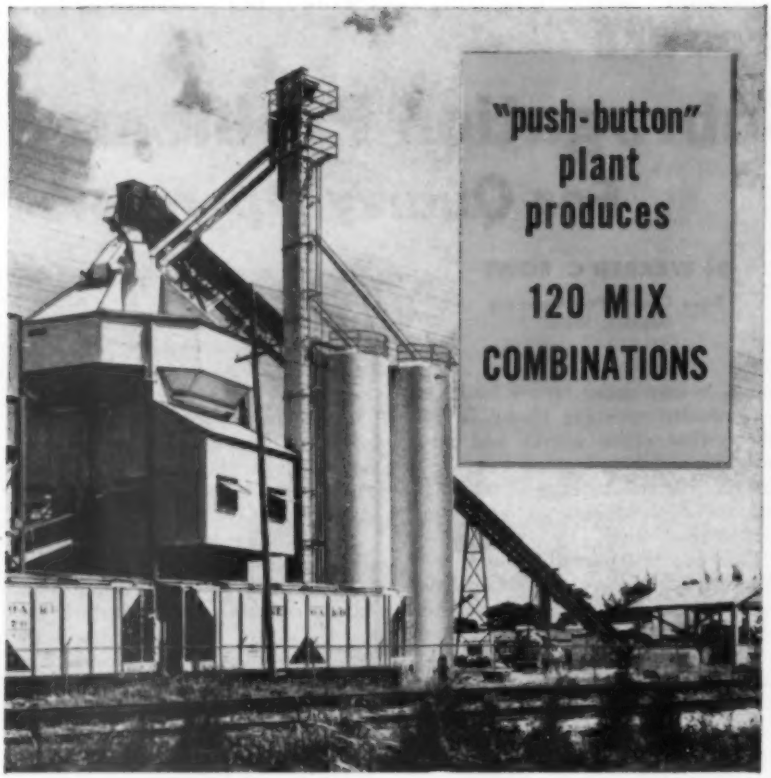
In Massachusetts the state Board of Fire Prevention recently revised its code of regulations to include a specific frequency-amplitude table within which quarries will have *prima facie* evidence of causing no damage. Such a table is based, with a conservative factor of safety, upon extensive government, university, and engineering research which long ago established the amount and character of vibration required to produce even the most minor damage in structures built according to accepted engineering practices.

Thus progress is being made in the field of truly interpreting quarry blasting, with the industry most anxious that the insurance world be brought up to date on the subject.

A typical hurdle is the case of an insurance company paying a small claim for "practical reasons" unrelated to the merits of the case. Under such circumstances quarry operators feel that exercising the subrogation privilege is immoral.

(*Continued on page* 88)

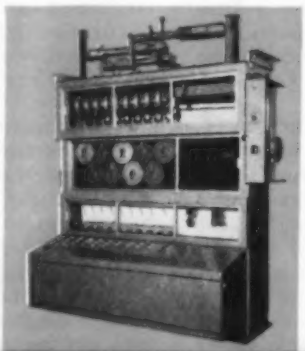
*Presented at the mid-year directors' meeting of the National Crushed Stone Association, held July 22 and 23 at Hot Springs, Va.



"Repeater" automatically re-batches any mix selection

At the turn of a dial and push of a button, this Johnson commercial transit-mix plant produces any one of 120 different size and type batches of aggregates and cement. It weighs out any combination of materials you select on the central dial-scale control panel . . . and automatically repeats any batch selections for a pre-determined number of times.

The electric-control, 120-mix-selector panel provides for concrete of various strengths in any combination of materials, in ½ to 2 cubic yard batches. For each size batch there are individual selections for 3 to 6-inch slumps. Dial system makes it easy to change from one mix selection to another. To get any size or type of batch, operator merely turns the selector dial, sets the "repeater", pushes the "start" button . . . and the plant weighs out fast, with pinpoint accuracy. During the batching cycle, a lock prevents accidental change of the mix selector.

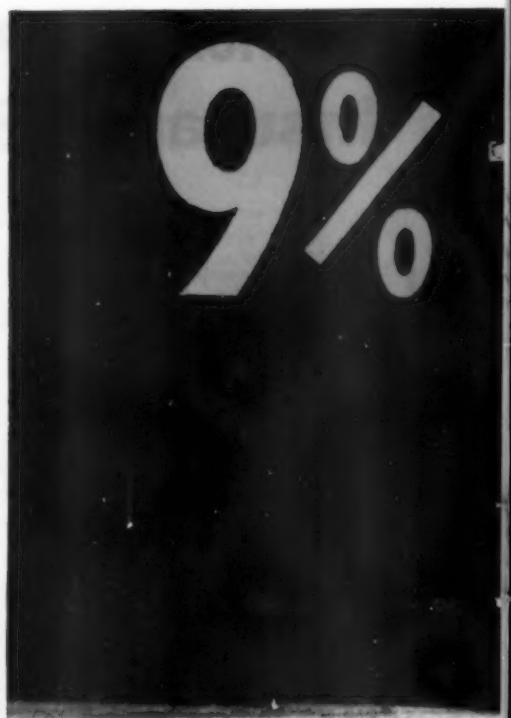


Nine material weigh-dials on the control panel have individual pen-recorders. Exact weight of each batch is automatically graph-recorded. Johnson batching equipment consists of: six 5000-lb. aggregate batchers (two with automatic moisture-compensators) . . . a 3000-lb. cement batcher with dual fill valves for selecting 2 types of cement . . . a 2000-lb. water weigh-batcher, and a 5-lb. (80-oz.) air entraining admix batcher. All are fully automatic.

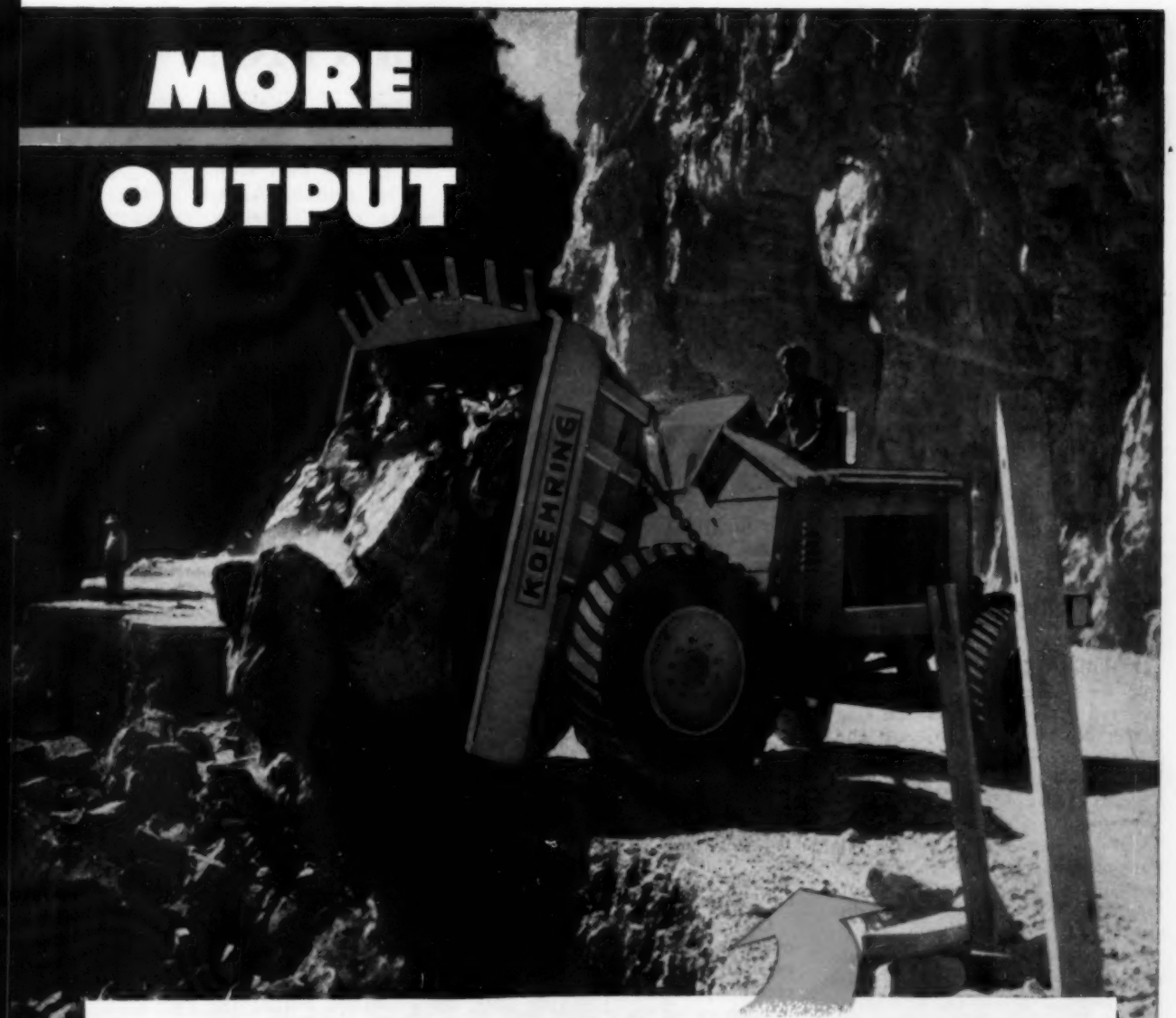
Whenever you plan a new plant . . . or want to modernize an existing set-up, look into the increased efficiency you can get with Johnson equipment. You'll find your Johnson distributor is at your service . . . ready to help at any time.

29

C. S. JOHNSON CO. CHAMPAIGN, ILLINOIS
Koehring Subsidiary



GRAVITY DUMP never balks . . . never wears out. You get the same one-second dumping every time . . . under heaviest loads, and in all temperature extremes. There are no hoist maintenance delays, no costly hoist replacement parts to eat into profits when you use gravity-dump Dumptors.



. . . with ONE-SECOND gravity dump

In just one second, Koehring heavy-duty Dumptor dumps its 6-yard load. Operator trips the body-release lever, and gravity tilts the scoop-shaped body 70°. One second later the load is out, and Dumptor is on its way back for the next load.

Because there's no waiting for slow-acting body hoists, Dumptor saves 15 to 25 seconds on every dump. This earns an important increase in extra yardage output. For example, take a typical 1,000-foot haul where an ordinary dump truck is making 16 trips an hour. Even if Dumptor took the same time to load, haul and return, it would average 17½ trips per hour on the same cycle. That's because Dumptor's one-second dumping advantage saves an average of 20 seconds on each trip . . . gains a total of 5.3 minutes more productive haul-time per hour. This, alone, adds 9% more yardage to your average hourly production.

What's more . . . by eliminating only 2 turns each trip, Dumptor no-turn shuttle-hauling adds another 10% increase in yards per hour. You'll find Dumptor® well worth looking into. See your Koehring distributor soon.

CK338

KOEHRING COMPANY MILWAUKEE 16, WISCONSIN
(Subsidiaries: KWIK-MIX · PARSONS · JOHNSON)

ACCELERATED DEPRECIATION

another P&Q exclusive

THE tax code recently enacted by Congress has one provision which may represent a very substantial tax saving during the next few years for pit-and-quarry operators; for others, tax savings may be illusory. The code permits taxpayers, at their option, to use accelerated depreciation on certain assets. Therefore, the care with which a quarry owner exercises his option or rejects it will have an important bearing on his tax bills for the life of the assets in question. While one owner may wisely elect to use a method which will accelerate depreciation, another, under different circumstances, may continue to use conventional depreciation with equal wisdom.

By HAROLD J. ASHE

This depreciation option applies only to depreciable *new property* acquired after 1953, provided that the taxpayer is (a) *the first user* and that (b) *his use started after 1953.* In addition, the property must have a useful life of *three years or more.* These qualifications must be observed because, otherwise, a taxpayer is foreclosed from using accelerated depreciation. There are other important considerations which will be discussed later.

Accelerated depreciation is simply a formula by which, in the first years of ownership, the *amount* of depreciation is increased *without shortening the life* of assets. However, there is a compensating offset. Eventually, recovery slows down and there comes a point at which recovery is slower than by the conventional straight-line method. It is this circumstance which warrants a taxpayer's consideration of all possible implications of accelerated depreciation before making an irrevocable election.

In addition to the straight-line method, the code now provides that a taxpayer may determine depreciation by: (a) a declining-balance method; (b) a sum-of-the-digits formula; or (c) any other method which does not result in the write-off of any more depreciation each year than by the other new methods.

Using a declining-balance method, around 40 percent of the cost of an asset is written off in the first 25 percent of its normal useful life, and about two-thirds is written off in the first 50 percent of its life.

This faster initial recovery is designed to encourage modernization and improvement, holding out the inducement of tax savings the first years after acquisition of assets. Many pit-and-quarry owners will see in this new provision an opportunity to modernize and replace aging equipment, and to see its tax-saving effects without being obliged to look too far into the future.

For example, the "life" of most sand, gravel, and stone quarry items ranges from 8 to 25 or 30 years (Bulletin F, Internal Revenue Service). Thus, if certain assets have a 15-year life, this means that 20 percent of the cost will be recovered in the first three years by the straight-line method. If the declining-balance method is used, almost 35 percent will be recovered in that period, come what may thereafter in earnings.

If, therefore, a quarry owner's net earnings are presently substantial, and there is reason to believe profits will continue high for the next four or five years, it may be wise for him to exercise his option and adopt accelerated depreciation on new assets acquired after 1953. For these years, tax bills will be reduced through increased depreciation.

On the other hand, another quarry owner having moderate earnings, but expecting long-range growth and increasing profits, may think twice before giving up the possible later advantages of straight-line depreciation. Taxwise, higher dollar depreciation may be worth more in the last few years of asset lives.

The declining-balance method works on a carefully calculated formula spelled out in the code. As a starting point, the normal useful life is used, as in computing straight-line depreciation. However, the declining-balance method involves taking twice the charge allowed for the first year by the straight-line method. Thereafter, this *rate* is taken on the *unrecovered balance.*

If, for example, a certain piece of machinery has a 15-year life, 1/15th is taken each year on the straight-line basis. The declining-balance involves taking 2/15ths of the cost the first year. In subsequent years 2/15ths of the *remaining unrecovered cost* is taken. In the straight-line method the annual depreciation write-off remains constant throughout the life of the asset. In the declining-balance method each successive year's depreciation is less than the year before. Continuing with the 15-year life for illustration, starting with the seventh year, the declining-balance recovery each year is less than by the straight-line method.

However, those using the declining-balance method (or the sum-of-the-digits method, to be explained later) may switch back to the straight-line method at that point where an advantage no longer accrues from the accelerated method. At this point, the straight-line meth-

Comparison of Depreciation Methods

Beginning of	Straight-Line Method		Declining-Balance Method		
	Annual Depreciation	Cumulative Recovery	Balance Unrecovered (*)	Annual Depreciation (*)	Cumulative Recovery (*)
1st year	None	None	$15,000	None	None
2nd	$ 1,000	$ 1,000	13,000	$ 2,000	$ 2,000
3rd	1,000	2,000	11,267	1,733	3,733
4th	1,000	3,000	9,765	1,502	5,235
5th	1,000	4,000	8,463	1,302	6,537
6th	1,000	5,000	7,335	1,128	7,665
7th	1,000	6,000	6,357	978	8,643
8th	1,000	7,000	5,509	848	9,491
9th	1,000	8,000	4,775	734	10,225
10th	1,000	9,000	4,092	683	10,908
11th	1,000	10,000	3,410	682	11,590
12th	1,000	11,000	2,728	682	12,272
13th	1,000	12,000	2,046	682	12,954
14th	1,000	13,000	1,364	682	13,636
15th	1,000	14,000	682	682	14,318
16th	1,000	15,000	None	682	15,000

(*) Rounded to dollars

total cost...

...of enough ERTRANE® C to give a barrel of portland cement all the advantages of air-entraining cement!

That's right! Mill superintendents who keep careful records report that to make air-entraining cement Nopco Ertrane C adds less than a cent a barrel to the cost of regular portland cement.

It's true that there are other agents which cost slightly less than Ertrane C—*to start with*. But count in time and labor costs, you'll find that with Ertrane C you're way ahead of any other product.

For, since Ertrane C is a completely water-soluble powder:

1. You *don't* pay for freight and storage on water, as with liquid additives.
2. You *don't* have to add other chemicals to dissolve it, as with other powdered additives.
3. You *don't* have to take time out to clean clogged feed nozzles.

We urge you to try Ertrane C in your own cement, mixed your own way. We'll glady supply testing samples. Because we know that once you keep cost records on it, you'll air-entrain with Ertrane C. Write today.

NOPCO
EVOLVED THRU RESEARCH

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od applies only to the *unrecovered balance evenly divided into the remaining years*. Thus, at the end of 15 years a taxpayer has made a complete recovery, just as he would in using the straight-line method, but with the possible advantage, taxwise, of more rapid recovery in the first few years.

Let's compare the declining-balance and straight-line methods to see their effect year by year. This will demonstrate the importance of choosing a depreciation method only after careful study. Assuming a 15-year life and $15,000 cost (after allowing for salvage or scrap value), the accompanying table shows how each method works out.

The sum-of-the-digits is another method of accelerating depreciation designed to accomplish the same end as the declining-balance method. The formula is somewhat more complicated.

First, the useful life is determined; then the years are added to get the denominator. If, for example, the life is 15 years, the denominator is found by adding 1, 2, 3, and so forth through 15 to arrive at 120. As 15 years is the useful life, 15 is the starting numerator. Each year the numerator is reduced by one. Thus, the second year's numerator is 14, the third year's is 13 and so on. In this example, the first year's depreciation would be 15/120 of the cost. If the cost is $6,000, the first year's depreciation would be $750. The second year's depreciation would be $700. This is a variant of the declining-balance in which, however, a declining balance of unrecovered cost is *not* used to make the calculation. The constantly decreasing numerator itself does this, and it is always applied to the *fixed* cost.

Some observers, hailing the accelerated depreciation formula, mistake both its workings and its purposes. As with accelerated depreciation of defense plants through a "certificate of necessity", this concession to non-defense business is sometimes misconstrued as a tax handout, *per se*. This is not the case. Regardless of the method of depreciation, a taxpayer can depreciate only on the basis of his cost. He cannot recover more than his cost. It does give him some latitude as to how this recovery is distributed over the useful life of assets.

Thus, accelerated depreciation permits a taxpayer to recover a larger part of his outlay in dollars having comparable value with those which purchased the assets. This will not completely correct the inequity inherent in buying assets with 100-cent dollars and recovering the outlay with dollars having less replacement purchasing power. However, it is a step in the right direction. Accelerated depreciation may reduce artificially inflated earnings —and at the same time reduce the tax bill.

Accelerated depreciation resulting in more rapid return of investment may have other beneficial results. A taxpayer may invest these faster write-offs in other depreciating assets. The straight-line method frees such funds more slowly and increasing replacement costs may erode the write-offs. Thus, in real dollars, as distinguished from nominal dollars, net worth may decline. Accelerated depreciation retards this tendency.

Not infrequently a taxpayer starts with all new depreciable assets and continues their use until they are written off, adding other depreciating assets during that period. Thus, accelerated depreciation confers special advantages for a time, at least. Depreciation is greater at the outset; and by the time depreciation on original assets declines, this is offset by newly acquired assets with maximum depreciation charges at the beginning of their useful life.

Accelerated depreciation may have another advantage under certain conditions. With the straight-line method, the overall cost of depreciating assets may rise over the years, even though the depreciation charge remains constant. That is, after a period of time, repair and maintenance costs may increase sharply. On the other hand, as depreciation, on an accelerated basis, declines, repair and maintenance costs may rise, resulting in combined costs (including depreciation charges) which remain fairly constant through the years.

If a taxpayer modernizes and expects to sell his business within a year or two or three years, accelerated depreciation will give him a distinct advantage, taxwise, provided he has earnings subject to tax. Thus, within a short remaining period of ownership, he gets the maximum advantage of accelerated depreciation.

Against all of these advantages, there must be set certain possible disadvantages. If profits rise in later years to the point where a taxpayer moves into higher tax brackets, lower depreciation charges will penalize him, taxwise; or, if Congress at some subsequent time increases tax rates, smaller depreciation write-offs can result in higher tax bills, although net earnings do not rise.

Or, consider the case of a taxpayer who does not set aside a reserve for replacing depreciating assets, but appropriates such write-offs for other personal needs. If he has smaller write-offs in final years, when replacements are becoming more imperative, he will have less depreciation charges to divert to replacement needs.

Date of acquisition of an asset is of paramount importance in considering whether accelerated depreciation may be used. If an asset was acquired in 1953, even though it was paid for in 1954, it does not have the benefit of this provision of the tax code. If an asset was acquired from another person in 1954 who used it in 1954, it is not eligible for accelerated depreciation by the buyer.

Alterations, improvements, or additions to a property are subject to accelerated depreciation, if otherwise qualified. This is true even though the original property is not subject to such depreciation treatment.

Subrogation Problems

(*From page* 83)

Then there is the nuisance value settlement which may seem the proper course to an insurance company, but which could never be tolerated by a permanent quarry operator who knows he did not cause damage in the first place.

Certainly the good faith and honest intentions of the insurance companies will urge them to investigate the conclusions already reached by so many eminent authorities. If they are convinced of the soundness of the scientific study of vibrations and shown that blasts in quarrying operations can be and are so planned in advance that the amount of resulting vibrations is kept within definite limits of safety, they should stop insuring against what does not happen.

Ground Granite a Possibility For Potassium Fertilizer

Ground granite, used in heavy construction, can also be used as a fertilizer, according to findings of a research program headed by Professor C. J. Lyon of the Dartmouth College botany department.

It was indicated that feldspar and and mica, both commonly found in granite, may be useful as potassium fertilizers for some crops. Perthite, a variety of feldspar, was found to benefit alfalfa, alsike, and some clovers. Best results were obtained when the mineral was ground to 200-mesh.

Motorists: here's proof...

Gulf's cleaner-burning, super-refined gasoline solves today's No. 1 engine problem!

This lamp is burning the "DIRTY-BURNING TAIL-END" of gasoline which GULF refines out
This lamp is burning NEW SUPER-REFINED GULF NO-NOX, the cleaner-burning super-fuel

Laboratory tests promised...

. . . these *immediate* and *lasting* benefits from this new, super-refined fuel:

More complete engine protection than from the so-called "miracle-additive" gasolines. Why? Because Gulf refines *out* the "dirty-burning tail-end" of gasoline (the No. 1 troublemaker in high-compression engines)—and then treats this new Super-Refined NO-NOX to give it a *complete range of protective properties*. It protects *every* part it touches against carbon, rust, gum.

Extra gas mileage in all your everyday, short-trip, stop-and-go driving.

No knock, no pre-ignition. Why? Because the anti-knock power of new Gulf NO-NOX has been stepped up to an all-time high.

Stall-proof smoothness. Instant *starts*, too—and fast, fuel-saving warm-up.

That's why new Super-Refined Gulf NO-NOX gives your engine more power-with-protection than you've ever known.

Road tests proved...

These cars, powered by New Gulf No-Nox, actually performed better than new . . . after 15,000 miles!

True! After 15,000 miles per car—covering all conditions of city and country driving—Gulf test cars showed these results:

- Higher-than-new horsepower!
- Better-than-new on gasoline mileage!
- And not a single trace of carbon knock or pre-ignition at any time—even on the steepest mountain grades!

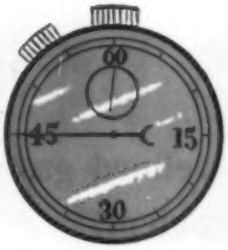
COMPLETELY NEW! SUPER-REFINED

New Gulf No-Nox

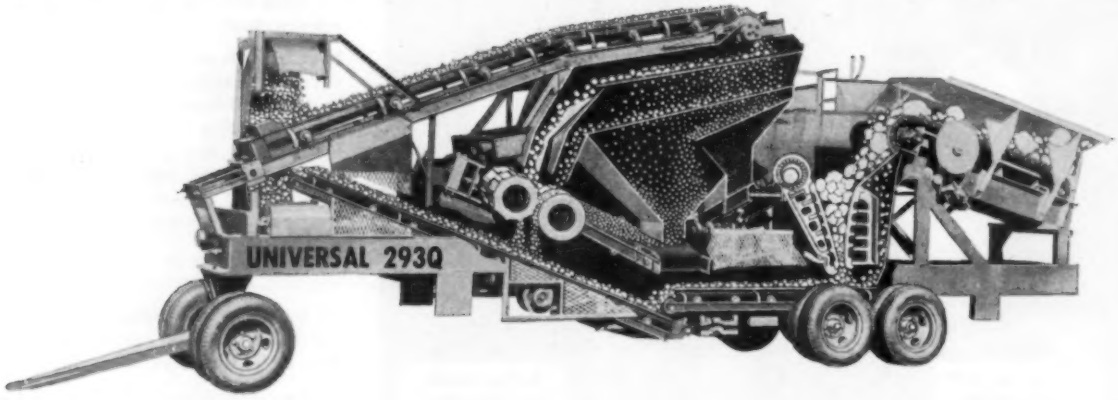
THE HIGH-EFFICIENCY GASOLINE

GULF

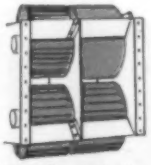
take 45 seconds to read this



and you'll know why Universal's 293Q is your industry's finest crushing plant



Universal 293Q TwinDual Pacemaker — two plants in one. Requires only one operator. For top capacity in rock and gravel. Completely portable.

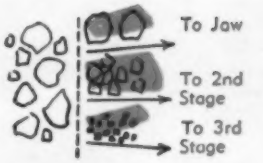


TwinDual Rolls

Universal gives you three full stages of crushing in a complete portable plant. There are actually 3 crushers in this exclusive 293Q Pacemaker. The jaw and two complete crushers in the TwinDual rolls (4 rolls — 2 sets mounted side by side on common shafts). Each is fed separately. No material enters any crusher unless crushing by that stage is required; in other words, a closed circuit after each crushing operation.

What this means! With 2 stages of reduction in the TwinDual roll crusher, the jaw is no longer a bottleneck . . . the discharge opening can be set up to 100% wider. Production is greatly increased — less jaw and roll wear — longer crusher life — less maintenance . . . because no crusher is burdened with over or undersize material.

9 big reasons why the 293Q is your industry's finest plant



1. TwinDual rolls permit up to 7 to 1 reduction ratio with 80% increase in capacity over a conventional roll crusher.
2. High roll reduction ratio doubles jaw capacity and gives better angle of nip.
3. Three separate stages of reduction in one portable plant; 1st stage — jaw crusher. 2nd stage — wide opening section of TwinDual roll crusher. 3rd stage — narrow opening section of TwinDual roll crusher.
4. High percentage of finish produced in each stage. 26% of material from jaw is finished and never enters another crushing stage. 53% of finish from second stage and 85% finish front third stage. Only 15% is again recirculated for crushing.
5. Here's the plant for rock or gravel. Large feed opening jaw handles large boulders in gravel pits.
6. Skid mounted jaw and feeder permits plant to meet highway weight limitations. Easy to move.
7. Only one plant to move. One power unit to service.
8. Feeder interchangeable with scalper screen for gravel operation.
9. Operators report up to 200 T.P.H. with 100% crush and 300 T.P.H. and over in gravel with 25% crush.

This is only part of the 293Q story. This plant is loaded with profit-making features to help you beat competition. Get the facts from your Universal distributor or write to Universal Engineering Corporation.

PETTIBONE UNIVERSAL
In Cedar Rapids, Iowa since 1906

UNIVERSAL ENGINEERING CORP.
619 C Avenue N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Illinois

POUND for POUND,

You Can't Beat a Bucyrus-Erie

▼ ⅜- to 4-cubic yard gasoline, diesel and single-motor electric

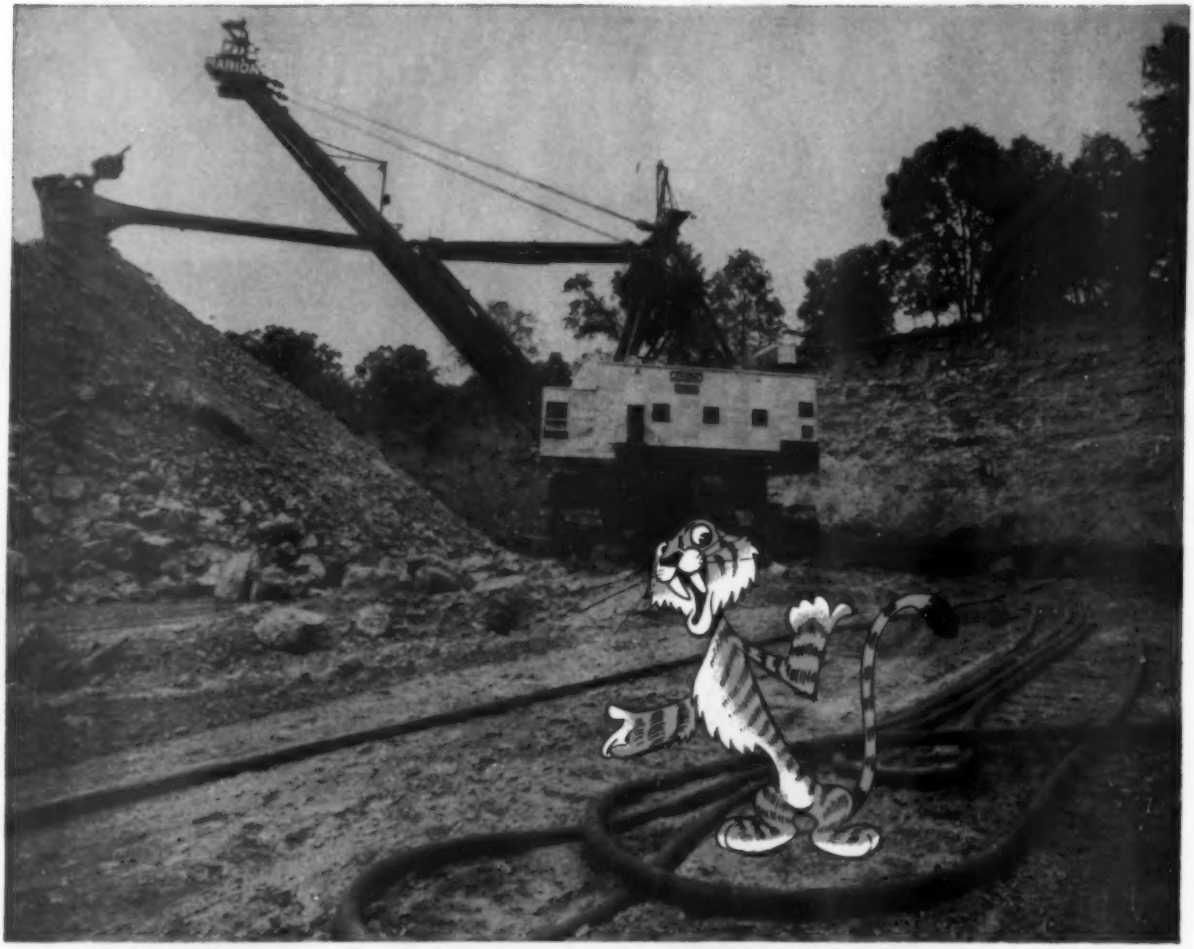
That's because each model in the Bucyrus-Erie line of ⅜- to 4-yd. excavators is *individually designed* all the way through from crawler treads to boom point sheaves for a definite size payload. Front end, main machinery, power unit, and mounting are all perfectly matched to dipper and bucket capacity. Maximum stability and maximum strength are obtained without that extra weight which slows down the operating cycle or adds to power consumption. That's why Bucyrus-Eries are so consistently ahead in output on loading and stripping operations.

If your quarry or pit calls for shovels or draglines with gasoline, diesel, or single-motor electric power in the ⅜- to 4-cubic yard size range, see your Bucyrus-Erie distributor for complete details on how you can step up output with a Bucyrus-Erie — the line that features Individual Design for each model. 27E54

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

They needed a top quality cable



THE 18-CUBIC-YARD SHOVEL moves a lot of overburden in a hurry. It is supplied with 7500 feet of 3-conductor 1/0 Tiger Brand Amerclad.

HERE IS THE MINE HEADQUARTERS. Wash tower is at center. Notice conveyor system at right that goes to power station over the hill.

like *Tiger Brand* for this high production strip mine

HERE IS A PORTRAIT of the 45-cubic-yard shovel that has removed most of the overburden at this mine.

IF you take a ride out near Zanesville, Ohio, someday, you'll spot the new Muskingum Mine—probably the most modern strip mine in the world. It supplies coal for the new 400,000 kw Muskingum River Plant of The Ohio Power Company, part of the American Gas and Electric System.

The big 18 and 45-cubic-yard electric power shovels operate day and night through sun, rain or snow. And when you consider the eye-popping cost of lost production time, it's easy to see why these shovels need the most dependable power cable on the market. At this mine, it's 100% Tiger Brand Amerclad.

The cable is always exposed to foul weather and accidental abuse. It often stretches for more than a *mile* from switchgear to shovel take-up reel. Yet, after more than 2 years on the job, the Tiger Brand Amerclad is in perfect condition without sign of wear.

If you need a cable that can *take it* . . . if you want cable for a power shovel, dredge, mine locomotive, welding machine or a heavy-duty electrical hand tool—you'll get more for your money if you specify Tiger Brand Amerclad. Drag it through puddles, over sharp rock; spill gasoline or oil on it and expose it to sun and ozone. Tiger Brand will still give you service you never thought possible. *Send the coupon.*

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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

A STANDARD TIGER BRAND CABLE FOR EVERY SPECIAL JOB!

paper & varnished cambric cable	shovel & dredge cable
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aerial, underground & submarine cable	machine tool & building wire special purpose wire & cable

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☐ Please give me more information about Amerclad.
☐ I'd like to talk to your representative.

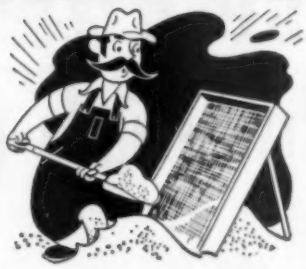
Name .....
Firm .....
Address .....
City ..... State.....

USS Tiger Brand ELECTRICAL WIRE & CABLE

USS

UNITED STATES STEEL

Screenings



by Ray L. Smith, Jr.

SOMETIMES we wonder if things are as "happen-so" as we think. Two months ago on this page we idly griped about the traffic situation around the country and suggested some things that oughta be done.

Almost like an echo, various items have since appeared in print reporting the progress being made to bring our highways up to standard. Gossip has it that as soon as the engineers get through drawing diagrams and the constructions crews get through constructing . . . . we get new roads . . . and security.

The proposed Toll Road seems to be the only means of speeding traffic, and in our nosing through reams of highway construction material, we have unearthed some interesting little-known facts about them.

Earliest record of a toll road dates back to 1950 B.C., when one was built by the Assyrians from Syria to Babylon.

When Julius Caesar built his road over the Alps, he changed one part of it to avoid cutting a fair-sized cypress. More than 2,000 years later it is still growing there.

Guatemala City has its streets numbered a la New York. Fifth Avenue is now one of the main drags. But Fifth Ave. in Guatemala City differs from New York's . . . it's spick and span. There's no gambling in the Guatemalan capital. Speed limit, 10 miles an hour. No jay walking. Sounds like an ideal place to live . . . between revolutions.

The first American turnpike was built in 1792 between New London and Norwich, Conn.

Weirdest facts of all come from *The Co-Operator,* which tells us that "if all the cars and trucks produced since World War II were placed end to end, they would stretch for 74,000 miles . . . three times around the earth. Yet the number of miles of roads has held a fairly constant 3,000,000 since shortly after World War I.

"The Automobile Manufacturers' Association estimates that all the cars and trucks in the nation, based on registration for the various states, would make a line 220,000 miles long. This means that there is a mile of cars, bumper to bumper, for every 13½ miles of road. Not bad you say? But that isn't the real rub. It comes from studies which show that 86 percent of all travel in the U.S. is limited to just 700,000 miles of road. If all U.S. motorists decided to go for a drive at the same time, there would be a mile of cars for every 3½ miles of road. And that goes for every highway and paved street in the area."

Dunno if you've read it, but the June issue of *The Dragon* sums the situation up with "In the old days, which were new days for automobiles, a large percentage of our roads were so narrow that it was almost impossible for two cars to pass without colliding.

"Now we have roads which make it easy for a half dozen or more cars to crash easily, and at the same time."

Danger — Curves Ahead

DON'T ever let any one tell you that plain old traffic signs and a sleek blonde charmer can't be a terrific combination. Here's proof as

displayed by Fenton Industries, Los Angeles.

The manufacturer claims it to be the only all-steel barricade on the market. We won't argue, as it may be true; but when it comes to stopping traffic, we are downright positive the young lady would do pretty well on her own, without any props.

It may be too cool for this sort of thing in most parts of the country about now, but this gal has the advantage of doing her job in sunny California.

All requests for name and address will be promptly ignored.

Potpourri and Succotash

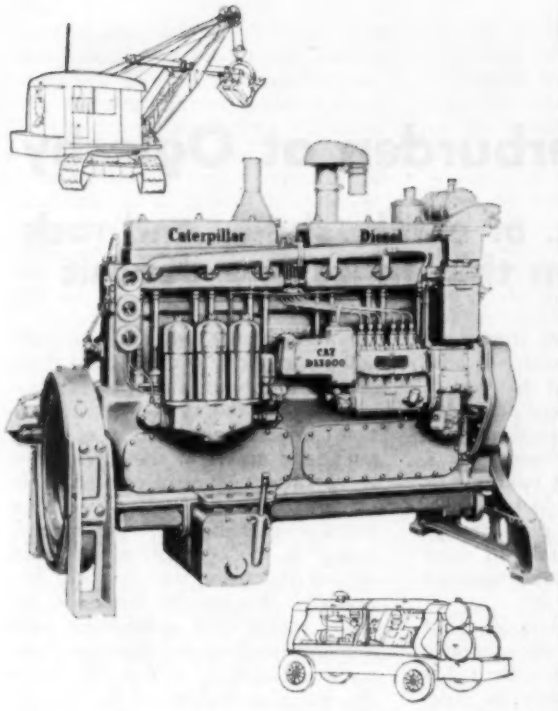
THE housewives seem to be getting more scientific all the time. One of our spies says a new kind of synthetic foam first developed for powder puffs is now being squeezed into building blocks.

Six contractors on a fishing trip ran out of provisions and sent one of the party to a nearby town to shop. He returned with six bottles of wine, a case of beer, a bottle of whiskey, and a loaf of bread. One of the group was heard to exclaim: "Good boy! You've even brought something for the birds."

Once again we are reminded that words are not always as docile as they seem to be, by a photographer's letter to comedian Moore (TV) which said: "Your baby, if you have one, can be enlarged, tinted or framed for 10 dollars." Along the same line, as chronicled by TIDE, is a recent announcement by a village newspaper. "Due to the shortage of paper, a number of births will be postponed until next week." Aside from the questionable possibilities of the two quotations, it is at least apparent that writers can make themselves ridiculous without half trying.

Speaking of the wizardry of words, we still chuckle at the thought of a cartoon we saw ages ago. Before the judge stood a rough-looking character with a policeman's club nudging his ribs. Said the criminal to the judge: "Can't you just let me off with a stinging rebuke?"

Sweet wife enthused, "oh, darling, I love that new kind of windshield. It'll be so much easier for me to windowshop while driving!"



Announcing the

NEW 190-HP CAT* D13000 ENGINE

CATERPILLAR ADVANCED DESIGN FEATURES IN THE NEW D13000

While retaining such time-proved features as aluminum alloy main and connecting rod bearings, "Hi-Electro" hardened and Superfinished bearing surfaces, exclusive Caterpillar fuel injection system, ability to use low-cost No. 2 furnace oil without fouling, etc., the new D13000 incorporates many new features, among them:

NEW Valves, Inserts, Rotators—new components, standard in the breathing system, combine increased breathing ability with longer valve life—make possible additional horsepower output and lower maintenance costs.

NEW Vibration Damper—sturdy, metal-enclosed, fastened directly to front of crankshaft. Keeps unit vibration-free at higher speeds. Optional in installations where engine speed is kept below 1000 r.p.m.

NEW Camshaft—improved high lift cam profiles give smooth valve seating and increased breathing ability. This increased capacity, also made possible by new oil-bath air cleaner and larger intake and exhaust manifolds, insures low exhaust temperatures and adequate reserve power.

NEW Water Pump—larger, with a greatly increased capacity to answer cooling needs of this modern, high-powered diesel.

NEW Pistons—oil-cooled, made of high-strength, lightweight aluminum alloy with stainless-steel heat plugs in the high-temperature zone and cast-in iron bands for the top ring groove to give best service at lowest final cost.

NEW Oil Pump—features not just one, but two pressure controls to assure correct lubrication for all moving parts from the first turn of the crankshaft.

For complete details, specifications, attachments, etc., see your nearby Caterpillar Dealer

...yours for greater power, production, profits!

For years, working in all kinds of construction equipment, conditions and jobs, the Caterpillar D13000 Engine has proved itself a big money-maker for power users. Now, here's a new D13000, designed and built to bring you even greater power, production and profits!

In the new D13000, you get 21% more brake horsepower. Its governed speed, raised to 1200 r.p.m., provides greater versatility and productive capacity. While keeping outstanding, time-tested parts, it adds advanced design features to set new standards of stamina, dependability, economy and long life. And its wide variety of matched accessories and attachments makes it readily adaptable for any need.

For jobs requiring power in the 145 (continuous) to 190 (intermittent) horsepower range, your best buy is this rugged new Cat D13000 Engine. Leading manufacturers of excavators, crushers, compressors and other heavy-duty machinery can furnish it in their equipment. Get the *complete* facts about it today from your nearby Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

D13000—A NEW STANDARD OF DIESEL POWER

Marquette

Strips Heavy Overburden at Oglesby

Up to 120 ft. of earth, shale, and rock moved from thin limestone deposit

By ROY L. PECK

another ON THE SPOT report

MARQUETTE Cement Manufacturing Company, at its two quarries near Oglesby, Ill., recently reached the halfway point in this year's goal to strip 2,000,000 cu. yd. of overburden, ranging up to 120 ft. in depth, in uncovering a limestone deposit averaging 27½ ft. in thickness. Over the last 24 years of this open-pit quarrying Marquette's scrapers and shovels have moved 14,000,000 cu. yd. of overburden, most of which has been transferred from the working areas to the exhausted portions of the quarries in such a way as to improve on the original appearance. Overburden removal on such a scale, to get at a comparatively thin limestone deposit, is an example of modern technique in using efficient, heavy-duty equipment in increasingly deeper pit work.

Marquette originally mined all the rock at Oglesby, from the start of operations there until 1921. At this time open-pit quarrying was started on a small scale and continued for partial production until 1936, when all underground mining was discontinued. The change to open quarrying was made because operational tests showed that cost of open quarrying compared favorably with that of underground mining, and because of the elimination of waste. In underground mining it is necessary to leave from 35 to 40 percent of the limestone in place as supporting pedestals, whereas in open quarrying 100 percent of material can be removed.

During those early days 50 ft. of overburden constituted the economic limit in stripping. This limit has been raised progressively as new, more efficient, heavy-duty equipment was developed, until at present the removal of 100 to 120 ft. of overburden, together with quarrying, can be done at a cost comparable to underground mining. In the early operation of this quarry, stripping became such a problem (mainly because of inadequate equipment) that quarrying was nearly halted at times until more rock was exposed, and 24-hour operation, six days a week, was necessary in stripping. The existence of hard cap rock, requiring drilling and secondary blasting, and inadequate hauling methods, using dump cars and low-capacity trucks, added their share of trouble to the operation.

Currently, the overburden formation consists of about 40 ft. of loam, sand, and gravel at the surface, 40 ft. of various types of colored shale interspersed with one or two thin layers of rock, about 7 ft. of cap rock, and 35 ft. of shale, with a thin seam of coal underlying the cap rock. Beneath all this lies the limestone deposit, roughly 27 ft. in thickness, with a definite and regular cleavage plane occurring from 1½ to 6 or 7 ft. above the irregular bottom of the formation. Marquette uses all the limestone, plus about 8 percent of this volume of certain types of the shale immediately above it in the manufacture of the cement.

Large-capacity scrapers are used to remove the top 40 ft. of overburden and about 20 ft. of the secondary formation of shale, down to the thin layers of rock in this formation. From this point down shovel removal and some drilling and blasting is necessary. Weather permitting, overburden is steadily removed in ten or more 8-hour shifts, weekly, the aim being to keep uncovered about a year's supply of limestone.

In disposing of the overburden,

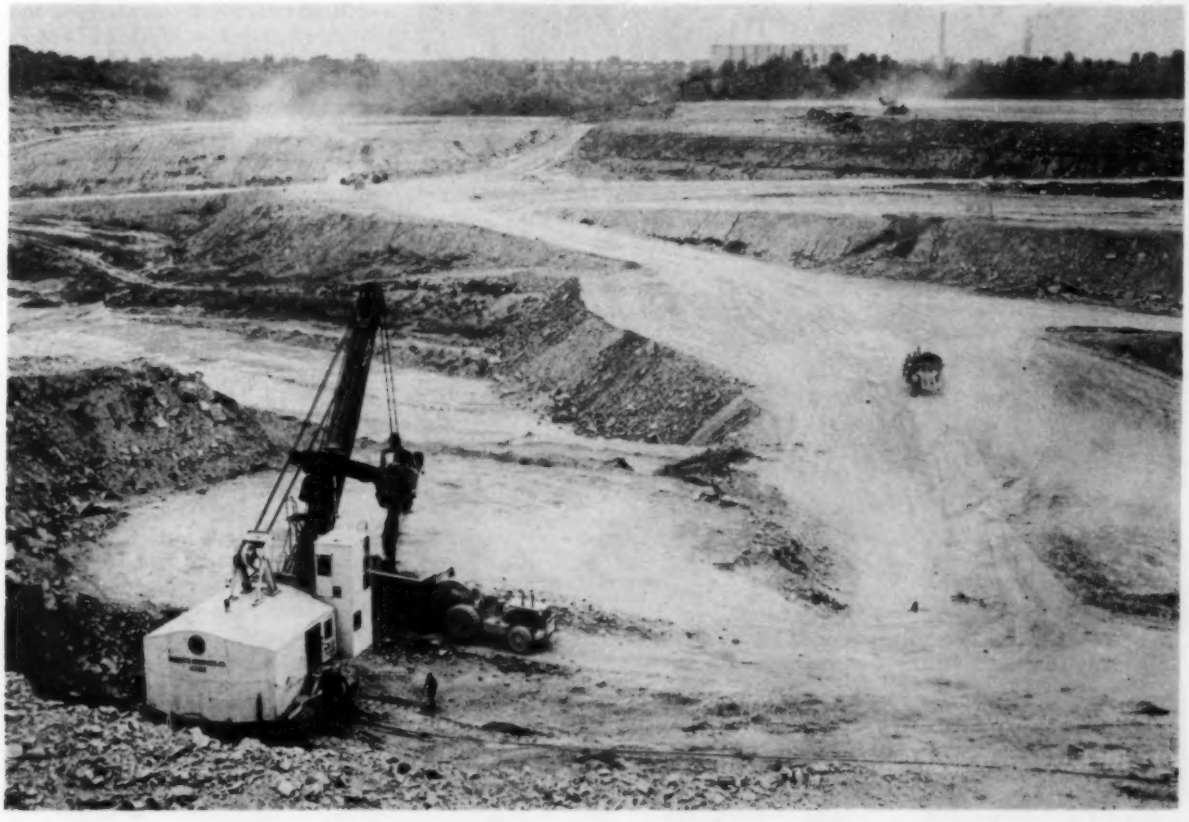
A quarry scene at Oglesby—three of the six scrapers, aided in loading by two bulldozers, remove the top 40-ft. formation of earth, sand and gravel down to the rock seams, at a rate of 8,500 cu. yd. per day. Note the maintenance shops in the quarry (left).

careful planning has been done to keep within an economical hauling distance. The average haul for placing the waste in exhausted portions of the quarry is less than 1¼ miles. To achieve economical operation of hauling units, in regard to grades and distance, the fill is built up in ledges, or tiers, about 300 ft. wide, and these serve as haul roads to the top of the fill. In running up the side of the fill in switchbacks, a (maximum) grade of less than 10 percent has been held, to keep all roads passable under all weather conditions. The top of the fill is level in contour, a contrast to the hilly slopes of the original surface. The elevation of the top is about 25 ft. below the former average ground level, this difference representing the amount of limestone taken out of the workings. The new, flat, smooth ground may one day be ideal for an airport location. Bailey Falls Creek, a small, spring-fed creek crossing the present No. 2 quarry area, has been diverted temporarily through an exhausted section of the quarry, and may be re-diverted to its original course upon the completion of stripping and mining in this area.

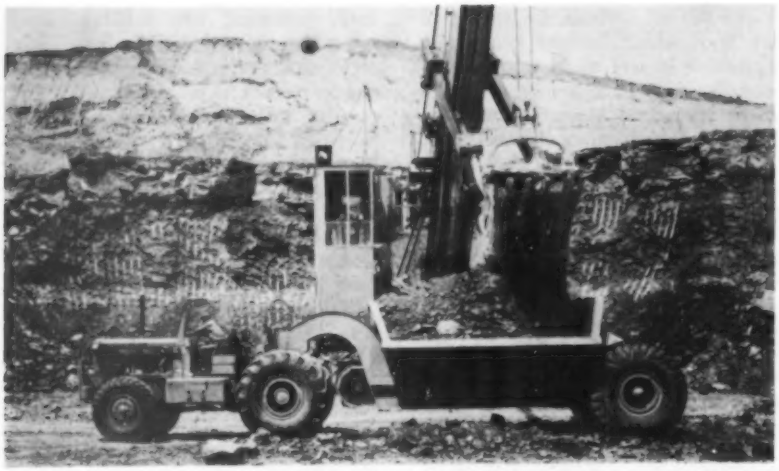
Early in the operation of open-pit quarrying, a layer of hard, sticky, black clay beneath the limestone created a serious problem. The rock face was at that stage being removed in one 27-ft. operation, leaving a clay floor which became practically impassable in wet weather. The distinct cleavage plane near the bottom of the limestone formation was the level to which the shovels later worked, leaving a 1½- to 6-ft. thick ledge of rock below, to serve as a quarry floor on which all equipment could work unimpeded by weather. This remaining ledge of rock is taken out by the shovels as a last operation before backfilling, which is accomplished in dry weather.

Several sequences of equipment operation are followed in stripping and quarrying. That portion of the overburden consisting of earth, sand, and gravel, and some of the very thin layers of rock (approximately 60 ft. in depth) lying above certain thicker layers of rock in the second formation, can be scraper-removed. This portion is now taken out by 5 Caterpillar DW21 tractor-scrapers (1 additional as standby); in loading, two Cat D8 tractors are used in pushing or bulldozing. The thin seams of rock can be rooted for scraper removal. The shovel digs out other thin layers. Some drilling is done here. Two Cat D8 tractor drills, each mounting two drills working off a Joy Model 125-B, 600 c.f.m. air compressor, are used here and on the cap rock work, but these are regular quarry drills. The drilled hole pattern will vary with the hardness and thickness of the rock encountered. The bottom half of this 40-ft. formation of shale above the cap rock is usually too hard to be removed with scrapers, so shovels are used here.

The next formation, approximately 6 to 7 ft. of cap rock not suitable for cement manufacture, must be drilled and blasted. The hole spacing in this layer is about 5 by 9 ft., and an average of ½ lb. of dynamite is used per hole. One Bucyrus-Erie Model 170-B shovel, equipped with a 55-ft. boom and 4-cu. yd. dipper, is used continuously at this level, removing blasted cap rock and 35 ft. of hard shale below. At times drilling and blasting is also necessary in this shale formation. The shovel loads this cap rock and shale into four Athey PD20 side-dump trailers, hauled by Cat diesel DW20 tractors. One P & H Model 1055 shovel occasionally alternates between stripping and rock removal in the quarry. In this area of work a new type of Athey PR21 rear-dump wagon, with a Cat DW21 as prime mover, is being tested by the manufacturers of this equipment.



This view across the quarry shows the carefully-maintained haul roads in exhausted areas. The finished backfill elevation is shown at the top right.



A shovel with a 4-cu. yd. dipper loading a side-dump trailer during stripping of overburden. Note the cap rock formation and the shale below, and also the depth of the earth, sand, and gravel overburden.

A rear-dump wagon with a diesel-powered prime mover, one of the largest pieces of equipment used in overburden removal at the quarry.

Two shovels working in the quarry, the upper unit removing overburden, and the lower one digging limestone in a 27-ft. formation. In foreground is mud underlying the limestone floor which is left in the quarry until final cleanup removal.

An International truck carrying a 230 c.f.m. Joy air compressor provides an easily portable drilling unit which is moved about the quarry to assist in secondary drilling. Two or three jack hammers are operated from this compressor unit. A No. 12 Caterpillar motor grader is used for maintenance of approximately 8 miles of haul roads in the area.

The drilling pattern for the limestone in the quarry averages 5 by 15 ft., the holes going down through this formation and into the ledge of the lower part of the limestone (to be later removed) about 1 ft. These 2¼-in. diameter holes are loaded with about 1 lb. of dynamite per foot of hole down to the cleavage plane. This amount varies according to the burden of the load encountered at each hole. An average of 5.1 tons of rock is moved per pound of explosive used. Primacord is used in all holes, and connections at the top terminals are taped to Primacord connectors. One electric detonator is used to fire all shots in a series. This procedure was adopted after some unpleasant experiences with misfires and lost holes, when firing was done from the bottom of the holes. The lower ledge of limestone must be drilled and blasted, when it is time for final quarry cleanup. One Bucyrus-Erie Model 100-B shovel and two Marion Model 4120 shovels, both electrically powered, load the limestone into five Mack LRD tractors with Easton or Gar Wood trailers.

Upon one occasion when lightning damaged a generator in the big 50,000-kw. per day steam power plant of the company, the Caterpillar Tractor Co. offered the use of its emergency electric generator set in the quarry. It furnishes 2300-volt, 350 kv.-a. current, the generator being powered by a Cat Model 397 diesel 500-hp. engine. The set had previously served several towns in this country and Canada in emergency use. The steam power plant of the company furnishes all power required for the plant and quarry, from waste heat from the kilns.

Haul distance for the limestone from quarry to crushers averages a 3-mile round trip, which is made in 25 minutes by the five Mack LRD tractors, each carrying two loads of 22½ tons of limestone or shale. The portal tunnels of two old under-

(*Continued on page* 103)

More Information, Please

HANDBOOK. A valuable guide to the use of multi-V belt drives, this 76-page engineering text by *B. F. Goodrich* reflects the improved abilities of today's fine belting. Give your title and firm to get a copy. (1)

CHANGE ROOMS. The design and layout of change rooms for your workers is discussed in this *Moore Co.* study. Moore makes the "Lockerbasker" for overhead storage of clothing and effects. (2)

INSTRUMENTATION. Devices that directly measure, remotely transmit, and automatically control industrial process fill *Foxboro's* 24-page pressure recorder catalog. (3)

AUTOMATION. The "tools" of automation must combine applied engineering, creative thinking and electric motor drives, this *Reliance Electric* brochure asserts. (4)

CRAWLERS. Fifty years of track-type tractors have made a big change in earthmoving. This interesting *Caterpillar* brochure emphasizes the role played by scientific manufacturing in perfecting today's machines. (5)

REFRACTORIES. Bricks, mortars, castables, maintenance coatings, insulation and related materials are shown in this *A. P. Green Fire Brick Co.* catalog. (6)

IT'S A DANDY. Flexible cover, thumb index, rapid reference charts and pithy descriptive material feature this 340-page catalog of *Link-Belt's* several lines—power transmission components, vibrating screens, conveyors, etc. You'll need it on your desk. (7)

INFORMATION on the use of blocks and sheaves with wire rope fill this helpful 20-page *American Hoist* catalog. (8)

NO WEAK LINKS to quit under stress is a major characteristic of the "engineered balance" of heavy-duty *Autocar* trucks shown in this bulletin. (9)

BIN LEVEL indicators of the pressure actuated type (with signals if needed) are shown in this *Bin-Dicator* installation data booklet. (10)

LOW COST WELDER. Ruggedly built for both light and heavy welding, the *Lincoln* Fleetwelder Special comes in 300, 400 and 500 amp. AC models. (11)

CENTRIFUGALS. Self-priming water-handling pumps are shown in this 12-page *Gorman-Rupp* catalog with helpful pump data. (12)

BIG RINGS. Weldless rolled rings, forged in various metals, with diameters to 240-in. and a variety of sectional contours, can be used in building or rebuilding kilns, driers, ring gears, autoclaves, sheave rings, tanks, etc. *Ladish* also furnishes heavy drop forgings to order. (13)

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

UNPAVED ROADS? You and your customers will find this booklet interesting. It tells how gravel, crushed stone and similiar roads can be converted and maintained as smooth, dust-free surfaces without upping present budgets. Written for the practical road man by *Solvay Process Division*. (14)

HANDY CATALOG. Quick reading is a feature of this 70-page general catalog of the *Bucyrus-Erie* shovels, draglines, drills, railway cranes and other equipment. (15)

FIRST complete catalog of *American Brake Shoe* industrial products, this 48-pager shows castings, bearing materials, sintered metals, forgings, welding products, air compressors, pumps, dredge pumps and railroad items. (16)

VEHICLES STEER easier with the *Air-O-Matic* power steer booster, easily installed on heavy trucks, cranes, tractors, etc. (17)

VIBRATING SCREEN. Only 6 bolts change to replace screen cloth in the *Lacco Vib* screen for sizing material from ¼-mm. to 8-in. on the same live frame and head. (18)

DOLLARS IN THE AIR. You can pull them out by using pneumatic bulk handling equipment made by *Fuller Co.* says this brochure. (19)

EARTHMOVER. Cutting to 6-in. depths, self-loading 5 and 8-yd. *Hancock* elevating scrapers work with industrial or farm-type tractors. (20)

THROW LOADER. Stockpiling or loading cars with a controllable 35-yd. throw, *Stephens-Adamson* Swiveloaders can be fixed or portable. (21)

SHAKER DRIVE. Straightline reciprocating force is imparted to conveyor pans, screens, feeders, etc. by *Ajax-Shaler* shaker driven shown is this bulletin. (22)

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More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

UNDERGROUND operations using Caterpillar tractors, shovels, dozers, graders and engines are described in this brochure. (25)

SHOVEL-CRANE. Modern design, low weight, low price and other features of the new 1½-yd. *Bay City* machine are shown in this bulletin. (24)

REFRACTORY MORTARS. Two high temperature, cold-setting bonding mortars — Harwaco Bond and chrome-base Thermolith — are described by *Harbison-Walker*. (23)

SAMPLING plant design, flow sheets and sampler descriptions fill this helpful *Denver Equipment* bulletin. (20)

BLAST HOLE tools for churn drilling are shown in this *Spang* catalog with hints for dressing and caring for bits and a discussion of the drill ream method of drilling. (27)

LUBRICATION. Every maintenance man will enjoy this lively, comic-book presentation by *Alemite* of the advantages of centralized lubrication. (28)

EQUIPMENT for materials handling — conveyors, elevators, feeders, etc., — fill this 32-page *Bonded Scale & Machine* catalog. (29)

HELPFUL. A condensed catalog of *Magic-Vule* products shows plastic and rubber coatings and sheeting for protecting equipment from corrosion and abrasion. (30)

VARY SPEED. A full line of packaged speed variator drives (1-200 hp) fill this 20-page *General Electric* bulletin. (31)

ONE-PASS PLANT. The new Cedarapids portable crushing plant for small scale aggregate production is described in this *Iowa* bulletin. (32)

LIGHT PIPE. Typical applications are given for *Naylor* lockseam-spiralweld pipe (4 to 30-in. dia.) and fittings. (33)

DIESEL UPKEEP. Data sheets give information for applying *Wall Colmonoy* hardfacing and spraywelding alloys to diesel engine valves. (34)

MORE WORK from wire rope is the topic of this *Leschen* folder listing 17 "life saving" tips for improving rope service. (35)

WELDING COSTS are analyzed and suggestions given for their reduction in this *Lincoln Electric* booklet. (36)

EN MASSE CONVEYOR. The enclosed endless chain Flowmaster handles all materials in any plane, this *Gifford-Wood* bulletin shows. (37)

INDUSTRIAL X-RAY can stop your losses by foretelling equipment failures. The *Norelco* portable unit fits in your car trunk. (38)

DUST COLLECTOR. Called a major advance in dust collection, the rotary arm Aeroturn shown in this *Turner & Haws* bulletin has capacities to 10,000 cfm. (39)

BETTER V-BELTS. A 40 percent increase in hp capacity over standard belts is claimed for the new R/M Super-Power V-belts, that also have greater resistance to shock loads and more length stability, says *Raybestos-Manhattan*. (40)

TRANSMISSIONS. Brief descriptions of the full line of *American Pulley* power transmission equipment—drives, reducers, sheaves, pulleys, etc. appear in this. (41)

LONG CRAWLERS. Extra-long, wide crawlers are found on the new ¾-yd. *P&H* Model 255 excavator described in detail in this bulletin. (42)

HANDY CHART. A comprehensive comparison chart on hardfacing rods and electrodes published by *Mir-O-Cel Alloy Co.* lists the products of 29 manufacturers, giving characteristics, applications, and other data. (43)

POWERFUL AUGERS for high speed drilling, vertical or horizontal, with diameters to 54-in. and depths to 150-ft. are shown in this *Salem Tool* brochure. (44)

ELEVATOR BUCKETS made by *Standard Metal Mfg. Co.* are shown in this 12-page illustrated catalog. (45)

DIAMOND DRILL core bits selection is discussed in this booklet from *Koebel Diamond Tool Co.* (46)

FLOWSHEET. Comparing initial and operating costs as well as tonnage in single-stage and two-stage grinding, this *Denver* study should be studied when engineering any grinding circuit. (47)

WIRE ROPE specifications for specific applications fill this *Bergen* sheet. (48)

SUSPENDED MAGNETS made by *Magnetic Engineering* are shown in this catalog. (49)

GEARMOTORS made by *Westinghouse* are shown in this 15-page booklet. (50)

OCTOBER 1954

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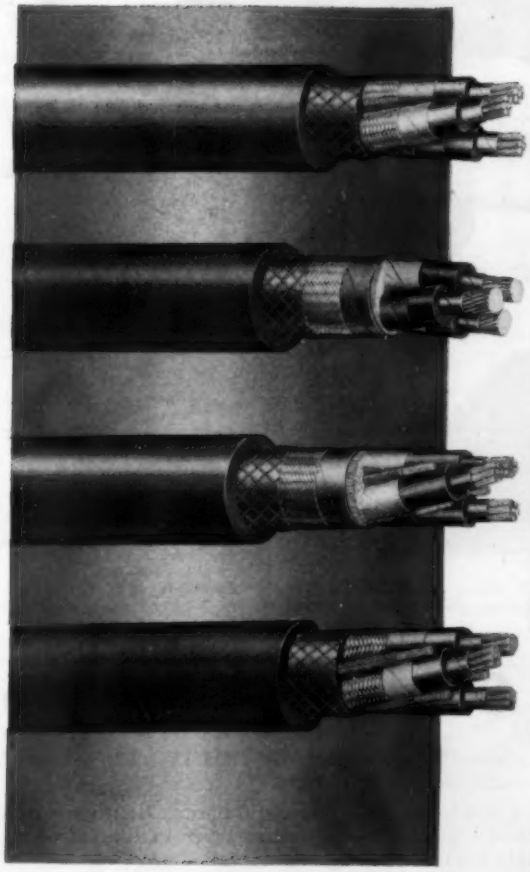

U. S. Royal SH-A Cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S Uskorona-1 oil base compound, and covered with colored tapes and a braided coated copper shield. The conductors are then cabled and covered with a reinforced jacket of 60% black neoprene. The shielded braid over each insulated conductor eliminates corona cutting by static discharge through equalization of surface stresses.

SH-B cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound plus colored tapes. Conductors are then cabled with jute fillers, covered with a rubber-filled tape, a braided coated copper shield and reinforced 60% black neoprene jacket. The shielding braid protects the men handling the cable in the event of fault currents.

SH-C cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape. The conductors are cabled with jute fillers and with the specified fabric-covered ground wires in the conductor interstices; then covered with a rubber-filled tape, braided coated copper shield and a reinforced 60% black neoprene jacket. This allows grounding of equipment and provides an adequate low-resistance path for short circuits, thus insuring circuit breaker operation. The grounded equipment provides protection to workmen under fault conditions.

SH-D cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape and a braided coated copper shield. The conductors, together with fabric-covered grounding conductors, are cabled and covered with a reinforced black 60% neoprene jacket. The conductor shielding, when properly grounded, equalizes surface stresses and draws off all capacity charging currents, insuring safety in handling. An adequate low-resistance ground for the equipment is provided by the grounding conductors.

All shields and grounding conductors, when used, should be properly and thoroughly grounded.

The constant dragging, flexing, twisting and bruising encountered in heavy service will not bother U. S. Royal Shielded Cables. You'll find that U. S. Royal never runs you into "downtime"—it's the most dependable, efficient cable you've ever used.

United States Rubber Company is the only electrical wire and cable manufacturer to grow its own natural rubber, make its own synthetic rubber and its own plastics. This permits control of the production process—resulting in a quality product.

Write to address below for free catalog, "U. S. Electrical Wires and Cables," describing the complete line.

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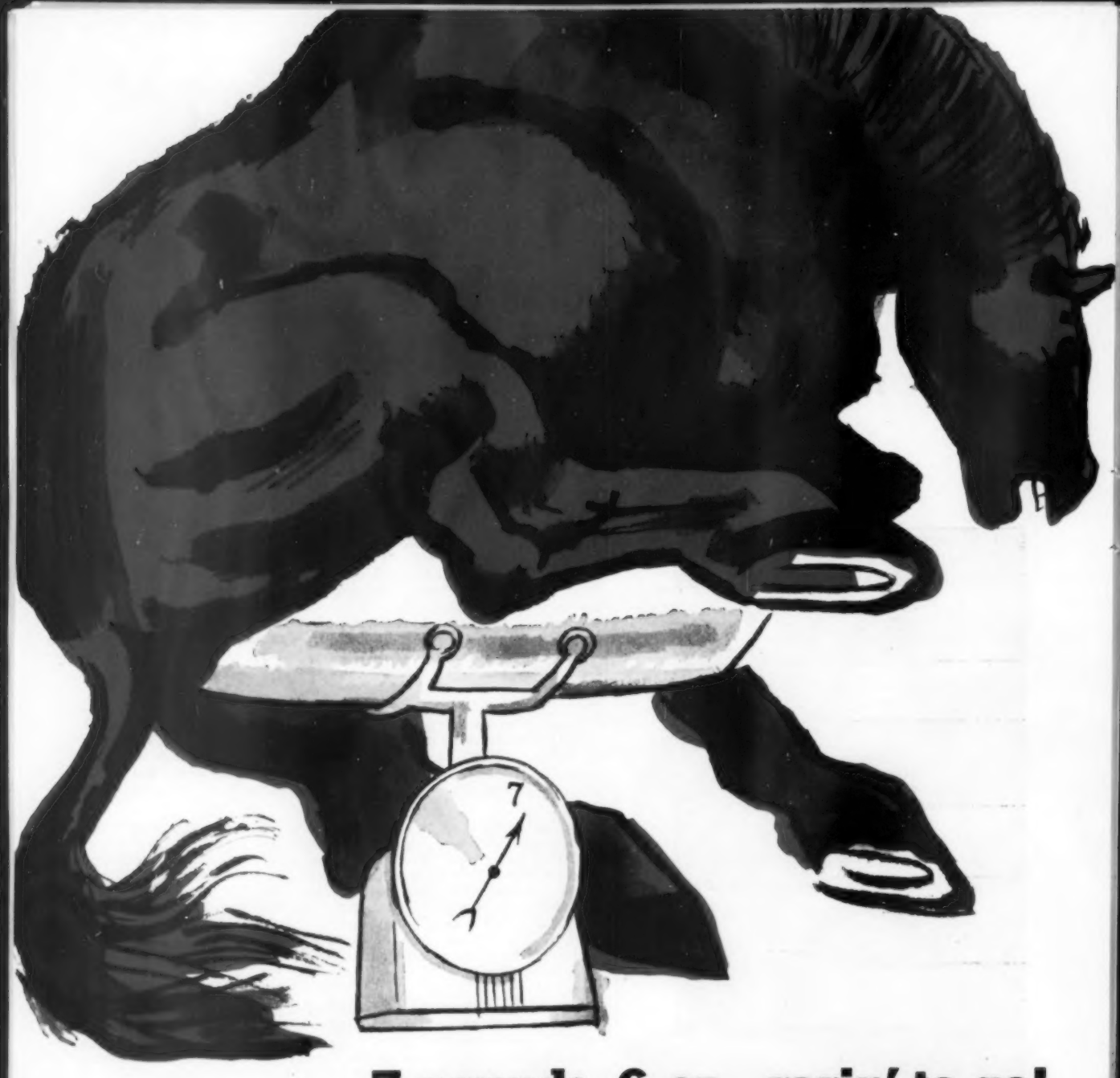
US RUBBER



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Not that it will need much servicing. Actually, a P&H Diesel takes less of it than the old gasoline engine. Its fuel cost: *about one-third.**

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THE P&H DIESEL

lowest price per horsepower . . .
lowest weight per horsepower

Marquette at Oglesby

(*From page* 98)

ground mining operations are now used in the route from quarry to crusher, two one-way passages being followed. The trucks also pass over the old railroad bridge, which now has a concrete pavement instead of the tracks used when rock was transported in narrow-gauge 7-ton dump cars.

The present cost of removing the 120 ft. of overburden and the 27½ ft. of limestone compare very favorably with the prior cost of the underground mining; in fact, it is claimed that the cost of the present method is comparable to that of similar large-scale operations with heavy-equipment in the iron range ore pits in Minnesota. A possible factor which might influence future costs is that the limestone deposit, according to test holes, dips away from the horizontal in certain areas of the 2000-

Trucks hauling limestone to the crushers use tunnels left from underground mining. The bridge was paved after the original narrow-gauge railway tracks had been removed.

Ralph Moyle, mill superintendent, and William Spurr, quarry superintendent. Note area of quarry floor left for moving equipment.

Starting the removal of 120 ft. of overburden at the No. 2 quarry. A tractor-scraper is used with a tractor as a pusher.

This emergency electric generator set, loaned by the Caterpillar Tractor Company, is capable of supplying power for the shovel in the background. This shovel is working on top of the limestone formation.

The working floor ledge of limestone, 1½ to 6 ft. deep, is underlain with mud (foreground). This ledge is taken out in the final clean-up, during dry weather.

acre property, where future quarrying is planned. No essential change from the basic system being followed is anticipated, however, since little increase in overburden is indicated. The present earthmoving spread is moving about 8,500 cu. yd. daily, when a 16-hour shift is worked. As for available limestone in the ground, at the present production level of about 12,000 bbl. of cement daily, the quarries are conservatively estimated to have sufficient limestone and shale for at least 50 more years of operation.

All repair and maintenance of equipment is done by company personnel. Two maintenance shops are used for this work. One shop, 40 by 80 ft. in size, is located near the crushers; the other, which is three times larger, is in quarry No. 1, available for on-the-spot work. Seven men are assigned to each of these facilities. Spare engines for the tractors and a well-balanced inventory of spare parts keep the shops prepared for almost any conceivable emergency.

Labor relations at the plant have been quite harmonious, no strikes or other lost time stoppages having marred this relationship since 1916. Safety of personnel is a must. To show that the workmen are following this teaching seriously Marquette quarry records indicate that August 3, marked the completion of 2,361 consecutive days without a lost-time accident since February 16, 1948. This period was preceded by 2,586 accident-free days beginning January 16, 1941. These records are significant in view of the extremely hazardous work in all phases of quarrying operations.

In this one of its eight plants Marquette produces over 4,200,000 bbl. of cement annually, and total production in all plants exceeds 12,000,000 bbl. Ralph Moyle is the mill superintendent for the Oglesby works; and William Spurr, quarry superintendent and an employee for 33 years, directs all quarrying operations.

N.S.G.A. Directors

(From page 74.)

of publishing a drivers' manual for the sand and gravel industry similar to the ready-mix manual which has been such a success. The proposed content, both illustrations and text, are along lines similar to the ready-mix book and met with the full approval of the board.

Walker's Report Stanton Walker, director of engineering of N.S.G.A., described some of the problems confronting producers of sand and gravel used for concrete.

Recent changes in the A.S.T.M. specifications put the burden of proof on the aggregate producer to show that his product is not reactive. The Corps of Engineers, he said, has relaxed some of its stricter specifications, but not on jobs where a plant is set up especially for it. For bituminous mixes he said that angular fines are even more important than angular coarse material, and he advised producers to use crushed sand where it will improve stability.

Mr. Walker also described some of the more important laboratory research projects under way, including one on flexural strength, a subject which is regarded very seriously by the Army and the Navy. He pointed out that much work is being done for individual member companies but that this is restricted to work not possible for local commercial laboratories. Mr. Walker stated that the great success of the bituminous short course was evidence of the growing importance of bituminous mixtures to the sand and gravel industry. The second course will be held in December at the University of Maryland. This course, he said, will involve more of a conference type of procedure than the 8-year-old sand-and-gravel and ready-mix course, and it will be aimed at those near the executive level.

At the joint meeting of the boards Mr. Walker said that since 1937 the University of Maryland has spent over $5½ million on its engineering department, where the association has its laboratory. Now, he said, the Asphalt Institute has made arrangements to erect a private building on the campus, where its offices and other facilities will be located.

In closing Mr. Walker mentioned the coming 5-day short course on concrete and concrete aggregates to be held the week of November 15 and the bituminous short course on December 7, 8, and 9. The coming convention in Miami, he said, will cover many important subjects, including crushing of gravel and sand, screening efficiency, ready-mix operating and maintenance problems, etc. He urged all members to send in suggestions for other subjects to be discussed.

Welfare Provisions It was pointed out that producers of sand and gravel and ready-mixed concrete have a very serious obligation to their employees to protect their interests in dealing with unions on welfare funds and similar subjects. The producer has a criminal and civil responsibility under the law; if an employee can't collect from a welfare fund, he can collect from the employer. Congress is trying to prevent misuse of welfare funds, and employers are permitted to take group action. The joint boards voted in favor of a resolution which would warn members of the two associations to be alert to their responsibilities under the Taft-Hartley Act for proper administration of welfare provisions of labor agreements.

Labor Developments

(From page 48.)

With respect to the future costs of pension and health and welfare programs, the strongest evidence is found in the developments in the steel industry, where the companies recently agreed to increase the benefits of the programs and to improve their financial foundation. The fact that, with a small downturn in business, an increasing number of these programs are experiencing financial difficulty suggests that other employers will also agree to increase their contributions so as to assure the solvency of the funds.

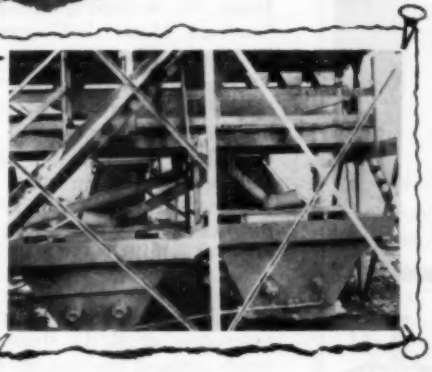
The Bureau of Labor Statistics has issued a series of reports on the various payments for time not worked from which the general conclusion may be drawn that such items as paid lunch periods, wash-up time, clothes changing time, etc., are not very widespread yet but that they are being adopted rapidly. There are also improvements in paid vacations, particularly for long service employees, and in the number of paid holidays. All of this suggests that the end of the trend toward increasing payments for time not worked is not in sight.

Only with respect to profit sharing payments and various kinds of bonuses which are generally discretionary is there likely to be a decline. But since these constitute so small a proportion of the total, they cannot reverse the trend. Only a severe business depression would do that—a cure far worse than the disease.

Net sales in the second quarter of 1954 of the Medusa Portland Cement Company, Maitowoc, Can., totaled $7,550,000.

SAND TO EXACT SPECIFICATION FOR 850,000 YARDS OF AGGREGATE

WITH Eagle WASHING AND CLASSIFYING EQUIPMENT



The Curtis Gravel Co., Spokane, Wash., is supplying aggregate from their gravel plant at The Dalles, Ore., for the Dalles Dam Powerhouse. Approximately 850,000 yards of aggregate is required. All fine material, from No. 4 to 100 mesh, is being processed by Eagle Equipment—a 20′ Water Scalping Tank, a 24″ x 25′ double screw fine material unit which produces one gradation of various meshes and a 30″ x 22′ double screw unit which produces another gradation of various meshes. Material to exact specification—"right on the button"—produced the efficient, economical Eagle Way!

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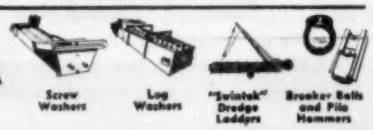

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personal mention

S. I. Burton

SEYMOUR I. BURTON has been elected a vice-president of Material Service Corporation and its subsidiaries, the Marblehead Lime Company and the Freeman Coal Mining Corporation, it was announced by Col. Henry Crown, chairman of the board.

A graduate of Northwestern University School of Law, Mr. Burton served three years as a naval officer during World War II. He left private law practice to become house attorney for Material Service Corporation in 1941.

Recent promotions in the National Gypsum Company's sales organization, include the following: JOHN S. CALHOUN to manager of the newly-created Milwaukee district; WAYMAN W. SMITH to manager of the newly-created Oklahoma district with headquarters in Oklahoma City; and WILLIAM E. WRIGHT to manager of the Chicago district.

The Milwaukee district will comprise the Upper Michigan Peninsula, about two-thirds of Wisconsin and part of Northwestern Illinois. The Oklahoma district will include Oklahoma, the Texas panhandle and Arkansas.

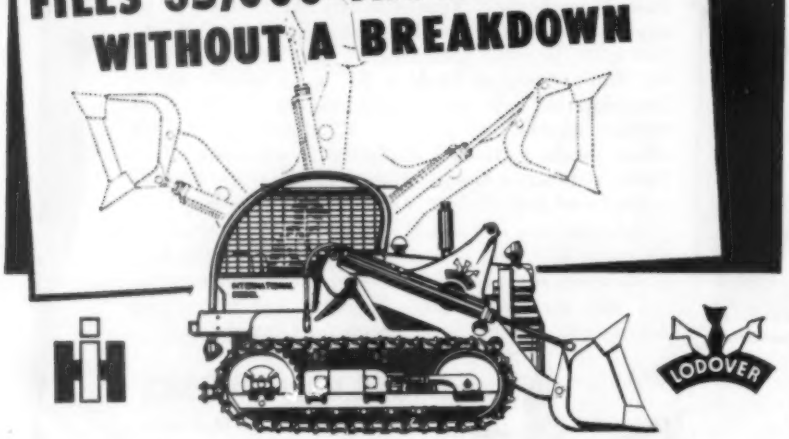
The following were appointed to a 16-man subcommittee on highway development of the Chamber of Commerce of the United States: G. DONALD KENNEDY, vice-president, Portland Cement Association, Chicago, Ill.; FRANK E. MCCASLIN, president, Oregon Portland Cement Company, Portland, Oreg.; and JOHN W. ROBERTS, vice-president, Southern Materials Company, Inc., Richmond, Va.

Chief aim of the group will be a review of Chamber policies in the highway field. It will work with the Chamber's Construction and Civic Development Department Committee and also with the Transportation and Communication Department Committee.

U. S. Gypsum Co. announces the promotion of R. C. BERREY to the newly created position of vice-president in charge of traffic for the company. He has been general traffic manager at Chicago since 1945, having joined U.S.G. as a rate clerk in 1937.

RALEIGH W. GAMBLE has been appointed district engineer in charge of the office recently opened in Chicago by the Asphalt Institute. Mr. Gamble was expressways director and street construction superintendent for the City of Milwaukee prior to coming with the Institute.

Beat this—ONE LODOVER FILLS 35,000 TRUCKS A YEAR WITHOUT A BREAKDOWN



That's the remarkable score reported by a New Jersey road builder using just one LODOVER mounted on an International TD-9. When it wasn't loading from gravel pits, it was busy on road construction and widening. It cut drainage ditches, lay culvert pipe, cleared land and trimmed trees.

It's quite an achievement—close to 125 truckloads a day for one LODOVER, the greatest no-turn overhead and front-end loader ever built.

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MELVIN H. BAKER, chairman of the board of the National Gypsum Company, Buffalo, N. Y., has been re-elected a board member of the National Industrial Conference Board for a one year term. The Board is a non-profit institution for business and industrial fact finding through scientific research.

B. J. STEGER, auditor, The France Stone Company, Toledo, has been elected a vice-president of the Toledo Control of the Controllers Institute of America.

At the annual meeting of the organization's Seattle Control, KENNETH A. STOTLER, secretary-treasurer, Pioneer Sand & Gravel Company, Seattle, was named to serve on the board.

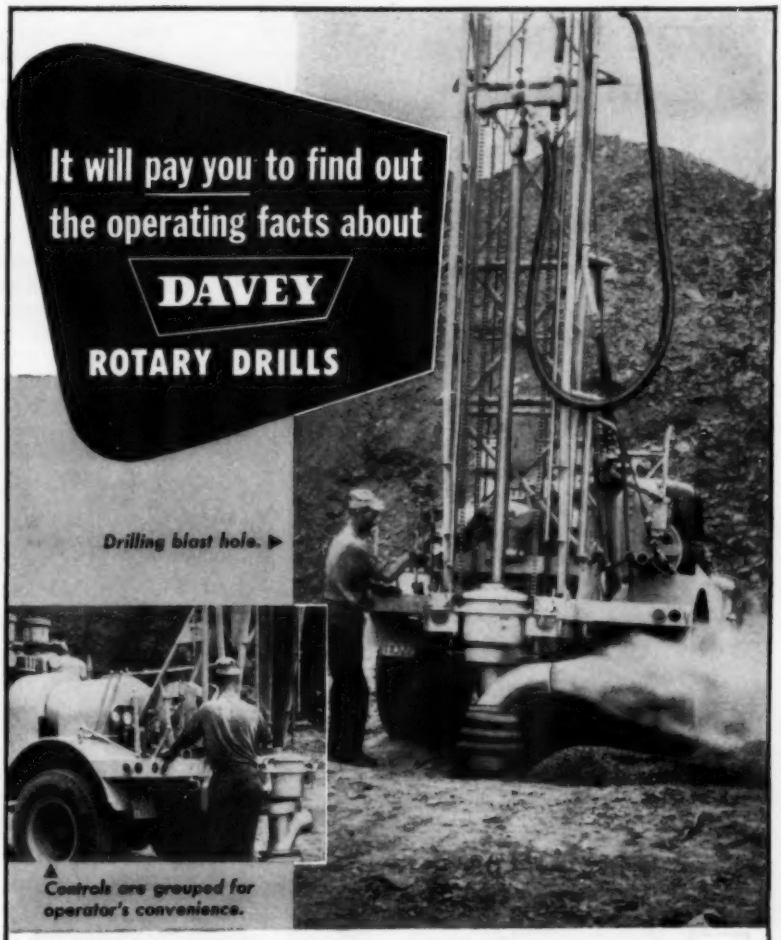
Established in 1931, the Institute is a non-profit organization of controllers and finance officers from all lines of business, banking, manufacturing, distribution, utilities, transportation, etc. The total membership exceeds 4,300.

RAY GRAVES was recently appointed assistant to general operating manager of Universal Atlas Cement Company. Mr. Graves joined Universal as a stores clerk at the company's Leeds, Ala., plant in 1926. He was transferred to the Waco, Texas, plant in October 1928 while it was still under construction. The following year he was appointed storekeeper at the Waco plant and in 1945 became plant engineer which position he has held until his present appointment.

In a recent re-organization of the sales department of the Calaveras Cement Company, San Francisco, Calif. into two divisions—dealer sales and contractor sales—three executives of the company have been given new assignments. MERLE SEGALE is now contractor sales representative; THOMAS LOVE, JR., is dealer sales head at Stockton, Calif., and WILLIAM JEFFREY, formerly of Stockton, has been transferred to the San Francisco office of the company.

Appointment of FORREST MULLEN and WALTER FISHLEIGH as new Pittsburgh district salesmen for the Zonolite Company was recently reported. Mr. Mullen will cover the northern West Virginia and southeastern Ohio area, while Mr. Fishleigh will be in charge of northeastern Ohio.

EMRYS L. WILLIAMS has been transferred from the company's architectural representative post in Cleveland to a like position in the Dearborn, Mich., district.



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Available in several "air blast" or "mud pump" models to meet individual requirements, Daveys drill faster and more economically than previously available units. For example, rated capacity of Model M-8A (as illustrated) is 5⅝ inch holes to a depth of 300 ft. with air and 7⅞ inch holes to 2,000 ft. with mud. Suitable for mounting on any make of truck, Davey Rotary Drills may be driven from the truck engine by a power take-off or by a separate gasoline or diesel engine. AA-202

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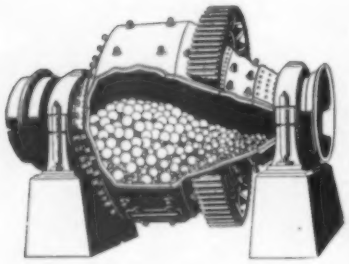

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CHARLES E. (CHUCK) ROBERTS, Morgantown, W. Va., recently joined the staff of the Portland Cement Association, as publicity director for West Virginia. For the past six years Mr. Roberts has been an associate of West Virginia's University's bureau of information, having been graduated from the university in 1920.

R. C. SPAHR has been appointed sales manager of the plaster and lime departments of the plastering materials division of United States Gypsum Co. He was previously sales manager of plaster bases, which is now to be headed by A. C. COOK, previously assistant to the vice-president in charge of sales of the company.

E. J. ELLSWORTH has resigned as vice-president and sales manager of Sierra Talc and Clay Co., South Pasadena, Calif., a 37 year old company which is one of the leaders in American talc production and technology. Mr. Ellsworth has been with Sierra for the past 13 years.

E. W. MCGOVERN has resigned recently as president and sales manager of Hermitage Portland Cement Co., Nashville, Tenn., a selling company for Marquette Cement Manufacturing Co., Chicago, to devote all his time to the Home Federal Savings and Loan Association of Nashville.

LEWIS T. WELSHANS has been made general manager of a newly created cement and coke division of the Diamond Alkali Co., at the Painesville, Ohio, plant. Mr. Welshans was the plant's technical director for the past seven years. Prior to joining the Diamond Company in 1944, he has been director of research for the Standard Lime and Stone Co., Baltimore, Md.

J. P. O'BRIEN has been appointed sales manager of Building Steel Products of United States Gypsum Company, with headquarters in Chicago. This is a newly created position.

Mr. O'Brien joined U. S. Gypsum in 1945 and in 1947 was promoted to district manager of the Pittsburgh District, his most recent position.

JOHN D. ZIGLER has been named to the newly created position of operating manager of the plant food division of International Minerals & Chemical Corp., Chicago, Ill. F. S. WALTERS was appointed production manager of the division, succeeding F. H. Perrin, who resigned. DON W. ALLISON was named division industrial engineering supervisor.

National Gypsum Co., Buffalo, New York, announces the appointment of WALTER EDGAR as sales office manager, Kansas City district sales office. Mr. Edgar was personnel director for the company at the Kansas Ordnance plant, near Parsons, Kan. W. J. STRECK, who was also at the KOP plant, has been made office manager of the newly created sales office at Oklahoma City, Okla.

DR. J. BRIAN EBY, Houston consulting geologist, has been named a director of the Texas International Sulphur Company. Dr. Eby will be in charge of the company's explorations for sulphur currently being carried on in the Isthmus of Tehuantepec, Mexico.

GEORGE W. BENBURY has been promoted to the position of assistant general purchasing agent of the Pennsylvania Salt Manufacturing Company, Philadelphia, Pa., according to Fred G. Prince, general purchasing agent. He was formerly purchasing agent for Pennsalt Chemicals.

TWO FEET A MINUTE

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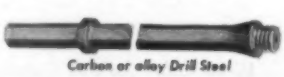
Intra-Set Drill Steel—cross or chisel types—gauge sizes: 1¼" thru 4".

Carbide Rok-Bits® and the Travel Drilling Machine make a combination hard to beat. Drilling blast holes on secondary work, this team does in one minute what it takes hand-held air drills to do in 6 minutes. What a boost for profits! Rok-Bits' unique NON-RIFLING balanced design minimizes steel breakage—reduces bit replacement costs. Why accept less? Write plant nearest you for details. Request bulletin B-1.

Carbide Rok-Bits—cross or chisel types—gauge sizes: 1¼" thru 4".



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Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Law of Implied Contracts

Last month a higher court rendered a decision which in considerable detail explains law unusually important to all buyers, sellers, producers, and contractors dealing in nonmetallic materials. This law relates to "implied" contracts and guarantees, about which a reader recently wrote. This reader said: "I have for many years read your legal writing . . . However, I am at almost complete loss when interpreting implied contracts and guarantees. Please explain this law in PIT AND QUARRY at your earliest convenience."

First, it is important to know that the higher courts have conclusively established the law that there are two kinds of contracts and guarantees. One is "expressed"; in the other kind the seller does not intend to give a guarantee or make a contract, but the court implies that one exists.

For example, if the buyer, expressly or by implication, informs the seller the particular purpose for which the materials are required, and the buyer relies on the seller's skill to furnish satisfactory materials, there is an "implied" guarantee.

A majority of the older higher courts held that there is no implied warranty of fitness in the sale of secondhand or used materials. In *Hysko v. Morawski*, 230 Mich. 221, the court said, "In general there is no implied warranty of the quality or condition of used equipment, nor that it is adapted to the purpose for which it is purchased."

On the other hand, modern courts recognize a principle of law that an implied guarantee always may arise with respect to new materials, provided that the purchaser informed the seller of the intended uses of the materials. And conversely, all the courts hold that no purchaser may hold a seller liable on a guarantee when the seller merely states his opinion as to the quality of merchandise.

See *American v. Hammond*, 55 P. 1090, 1091. In this case a seller stated that his "opinion" was that the materials he had for sale would prove satisfactory to the purchaser. Later the purchaser sued to rescind

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DEEP DOWN SPOT DIGGING...

Tangible, valuable features contribute to the exceptional trench excavating of
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Basic features include: *correctly designed shells* for easy penetration and discharge—*removable counterweights* to help force the shell into material and the block and tackle principle of multiplying closing power.

Others are *low headroom* that makes handling easy—*low center of gravity* that aids in placing the bucket when below the line of vision and *side cutters* which cut clearance for the bucket and aid in maintaining parallel trench walls.

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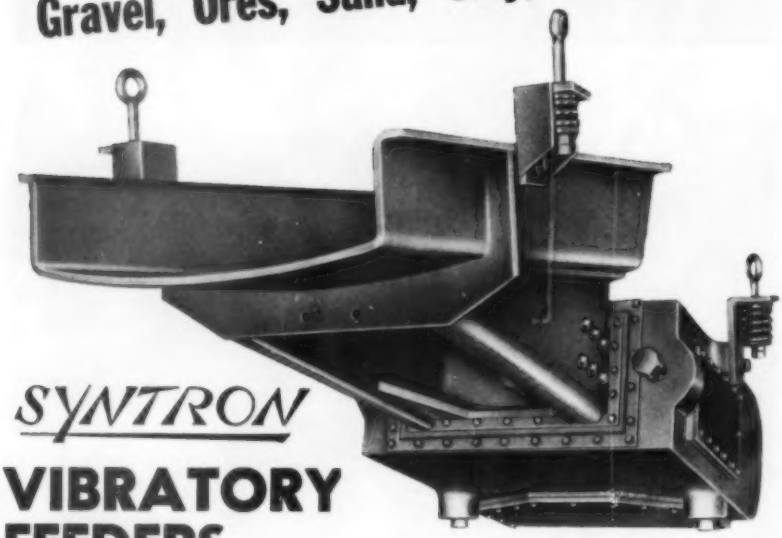
For Controlled Feeding Of Rock, Gravel, Ores, Sand, Clay, Slag, etc.



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Finger-tip controlled feeding from a few pounds to hundreds of tons per hour permits accurate delivery of materials to mixing, bagging, grinding and many other processing machines.

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the contract. This court said, "The general rule is that a representation cannot form the basis of an action for falsity unless it relates to a matter of fact, as distinguished from opinion."

The above law relates to implied guarantees. But the courts also hold that a contract may be implied if either party did anything which led the other party to believe that a contract existed.

For example, in *Williamson v. McCann & Company, Inc.*, 118 N. E. (2d) 42, the testimony showed that a property owner owned two gravel pits. He made a contract with a company under which the latter could remove gravel from one of the pits at a named price per yard.

Without permission of the owner of the property the company began taking gravel from both pits.

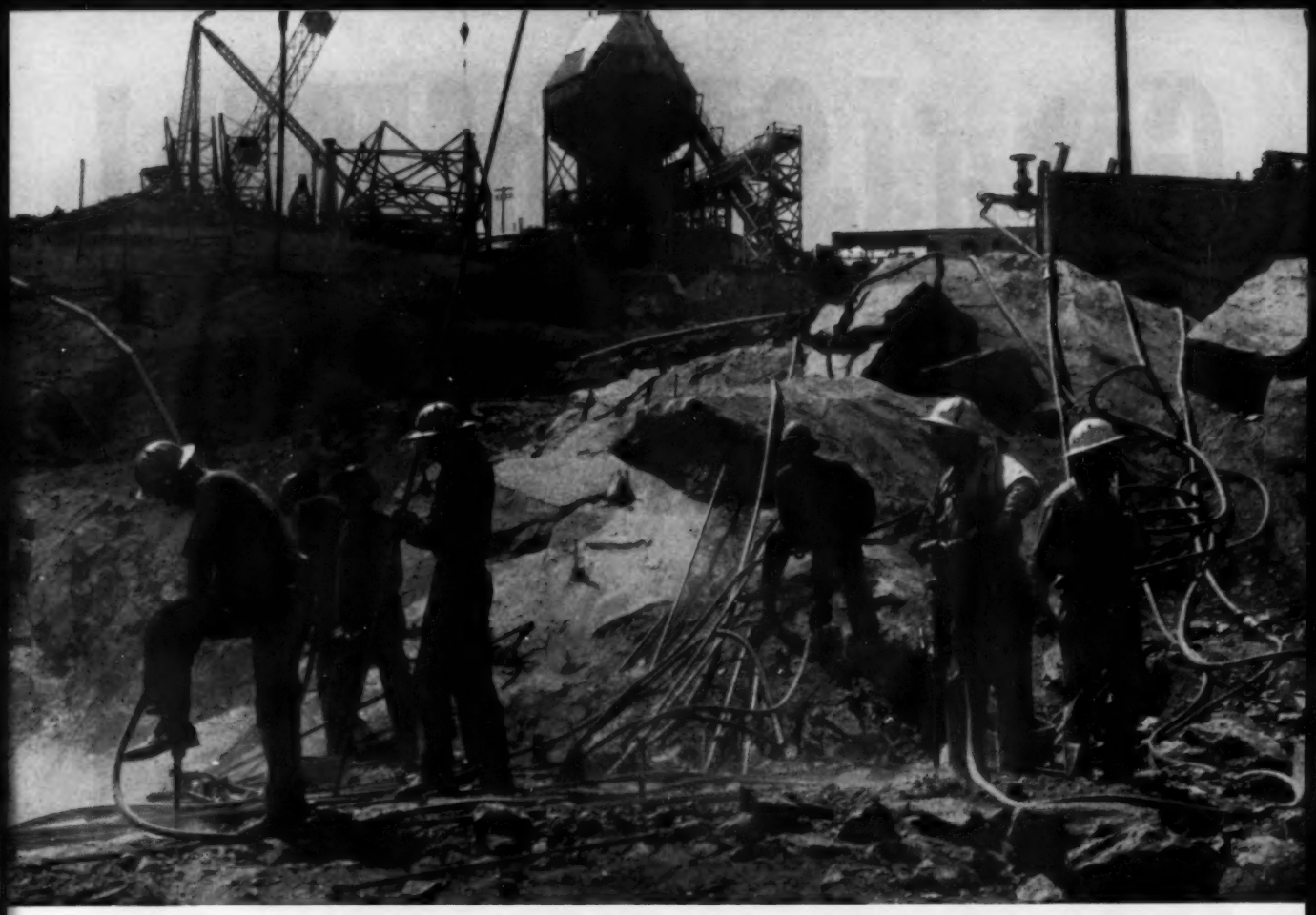
In subsequent litigation the higher court held that by not objecting to removal of gravel from both pits and accepting a part of the money paid therefor, the property owner had ratified the actions of the company, and he was estopped from denying that there was an implied contract. In other words, this higher court held that the company could take gravel from both pits and pay the property owner the agreed per yard price specified in the original contract for gravel taken from one pit.

Duty To Invitee

Considerable discussion has arisen from time to time over the legal question: What legal duty has the owner of a quarry or gravel pit to protect motor owners, drivers, and other invitees, against injuries?

Last month a higher court clearly answered this important legal question. This court held that it may be conceded that an invitee assumes all normal, ordinary, and obvious risks attendant upon the use of the premises. Nevertheless, a property owner who knows of dangerous or unsafe conditions owes a duty to an invitee to warn him of the danger where the peril is hidden, or the invitee has no knowledge thereof.

For illustration in *Dunagan v. Bledsoe*, 267 Pac. (2d) 586, the testimony showed facts, as follows: A man named Dunagan, used heavy machinery for excavating dredging, washing, lifting, moving, loading, and transporting sand and gravel. Upon a part of said premises Dunagan maintained stockpiles where the washed conglomerate was dumped, drained, dried, and later loaded by means of a power shovel upon trucks for transportation from the pit. These stockpiles were located in a draw or ravine to permit better



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THERMOFLEX—Mandrel-built air hose for extreme service and direct connection to compressors. Smooth, black abrasion-resistant cover.

VERSICON—Most versatile hose ever developed. Handles air, water, oil, gasoline, dilute acids and gases. Ideal for use with air-operated tools.

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Thermoid research is responsible for new, better hose construction which makes Thermoid Hose more durable . . . easier to handle. Quarrying and construction work also demands the best in Conveyor Belting and Multi-V Belts. Ask your Thermoid Distributor for complete information on all these Thermoid Products. Or if you prefer, write direct.

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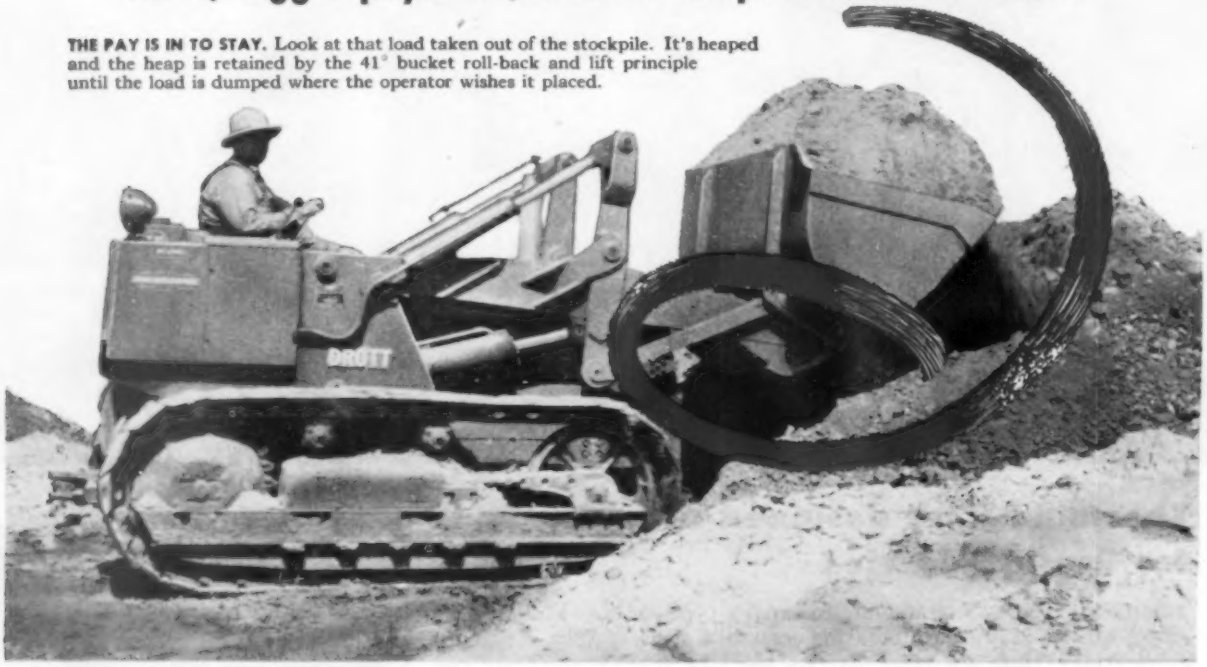
Exclusive DROTT Skid-Shoes are the big reason why INTERNATIONAL crawlers with DROTT Skid-Shovels deliver 300% greater digging force, bigger payloads, faster transport than all others!

THE PAY IS IN TO STAY. Look at that load taken out of the stockpile. It's heaped and the heap is retained by the 41° bucket roll-back and lift principle until the load is dumped where the operator wishes it placed.



Big news in the front-end loader industry today is the amazing performance of the new leader in loaders—INTERNATIONAL crawler equipped with DROTT Skid-Shovels.

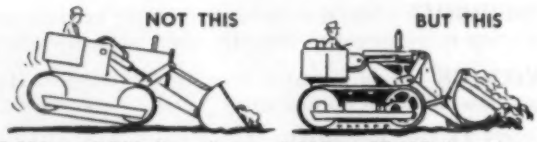
DROTT Skid-Shovels have exclusive Skid-Shoes that permit use of the ancient lever principle to supply 300% greater break-out force than all other shovels. These same Skid-Shoes transmit loading force into the ground and let the units transport heaped loads at ground level in third gear—not first—to speed every loading cycle and eliminate carrying strain.

The Hydro-Spring is still another DROTT exclusive—absorbing 70% of the shocks normally encountered in front-end loaders to extend equipment life and make operating far easier.

Skid-Shovels come in four sizes—⅞, 1¼, 2 and 3 cu. yd. buckets for the INTERNATIONAL TD-6, TD-9, TD-14A and TD-18A. You can get an eye-opening demonstration of the model suited to your needs by simply calling your INTERNATIONAL Industrial Power Distributor today.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

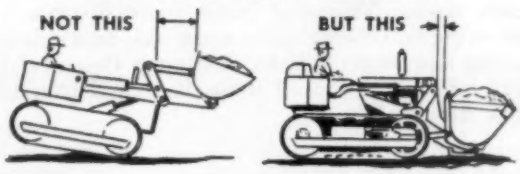
PRY-ACTION BREAK-OUT



3,000 to 9,000 lbs. all on front of tractor

9,000 to 27,000 lbs. all on loader shoes on ground

SKID-SHOE TRANSPORTATION

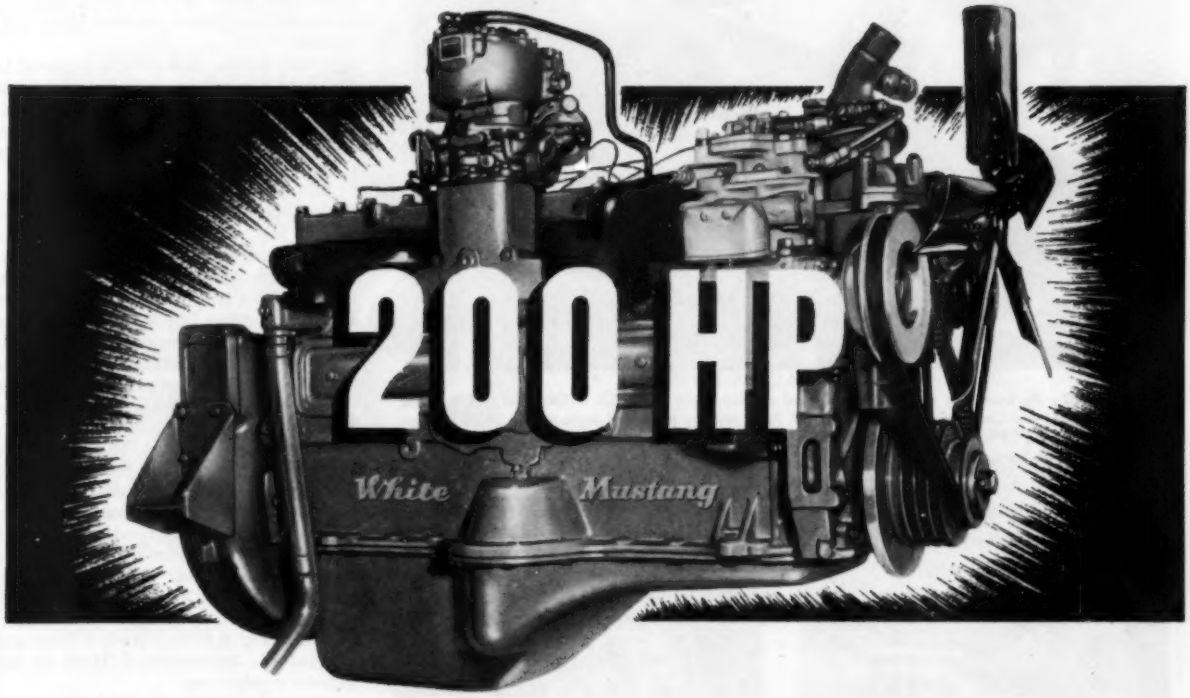


INTERNATIONAL HARVESTER

INTERNATIONAL DROTT

NOW–a great new engine for AUTOCAR TRUCKS

The White Mustang 390A



Here's the greatest gasoline engine ever to power an Autocar truck. The White Mustang 390A, a modern high-compression engine producing 200 horsepower and 440 pound-feet of torque. It has more power per pound, and all the other features you look for in a heavy-duty engine for high-speed hauling.

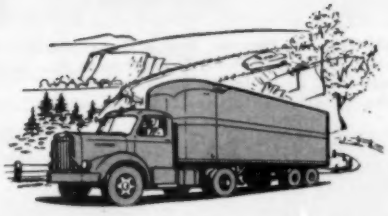
You will want full information on this important addition to the Autocar line. Fill in the coupon and find out what this engine can do to make your hauling more profitable—you'll be glad you did.

The mighty Mustang is also available for your replacement engine needs
See your White-Autocar representative about the special installation kit available for your present Autocar in 145 and 200 hp engines.

AUTOCAR TRUCKS

Autocar Division of The White Motor Company
Exton, Pa.

Autocars are sold and serviced throughout the world



Autocar Division of The White Motor Company
Exton, Pa.

I want to know more about Autocars with the White Mustang 390A Engine.

Name_____

Firm Name_____

Address_____

Type of operation_____

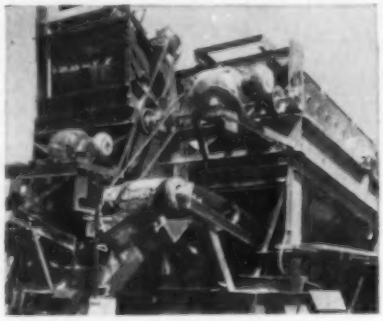
No. of trucks in fleet_____

24K

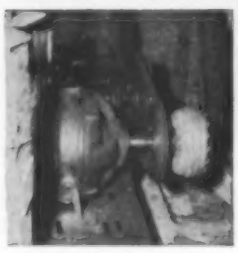
Aggregates producers "shake down" costs with fluid drives . . .

CONVEYING—By providing soft, cushioned load pick-up, Twin Disc 10.6 HYDRO-SHEAVE® Drives on this conveyor—at Certified Aggregates Co., St. Paul, Minn.—permitted replacement of 20 hp high torque motors with 15 hp normal torque motors.

LOADING—At Meramec Sand & Gravel Co., Pacific, Mo., a Fluid Power Take-Off helps this Lorain L-820 2-yd. dragline obtain faster work cycles, by providing a smooth flow of power.



SIZING—Heavy starts, overloading motors, were cured by 10.6 HYDRO-SHEAVES on these vibrating screens at Stoneridge Limestone Co., Rochelle, Ill.



STOCKPILING—With mechanical drive on this stiff-leg crane at Herbert Sand Co., Milltown, N. J., constant jerking of the 48-ft. boom caused the 15 hp motor to overheat. A Twin Disc 9.5 HYDRO-SHEAVE solved the problem by cushioning out the shock-loads. Motor burn-outs have stopped; load placement is more accurate.

Today, more and more aggregates producers are "shaking down" maintenance costs—and improving performance—on *both* motor- and engine-powered equipment, by installing fluid drives.

These drives, technically referred to as Fluid Couplings and Torque Converters, are made by one of the oldest, most experienced power linkage manufacturers in the business: Twin Disc Clutch Company.

Benefits derived from fluid drives are outstanding. Twin Disc Fluid Couplings, for example, are improving operations through one basic factor: *the elimination of mechanical connection.* On motor- or engine-driven equipment, heavy starting loads are picked up softly, smoothly through *fluid* . . . while the power source accelerates rapidly to normal rpm without stalling, lugging, or burning. Vibrations, shock-loads, jams, and torsional variations are cushioned *out*, by the fluid "slip". On compounded drives, loads are distributed *evenly.* On many installations, high torque motors installed for starting requirements are replaced by smaller, normal torque motors selected for running requirements. And through the patented Twin Disc *Twin-Circuit* design—featuring *two* impellers instead of one—the input torque from motors and engines is transmitted 100% to the driven equipment.

Twin Disc Fluid Couplings are easily installed on conveyors, vibrating screens, cranes, draglines, hoists, power shovels . . . *any* motor- or engine-driven equipment from ¾ to 850 hp. Ten different Models with a broad variety of input, output combinations makes them adaptable to nearly any hook-up. *Write today to Twin Disc Clutch Company, Hydraulic Division, Rockford, Ill., for Fluid Coupling Bulletin 144-D.*

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

This NEW HOYT Handbook

has the facts you want on AGGREGATE WIRE SCREENS

BEFORE you order it's good business to have all the facts at your fingertips. That's why we want you to have our new Handbook on Hoyt Aggregate Wire Screens. In this easy-to-use, pocket-size Handbook you'll find complete information on . . .

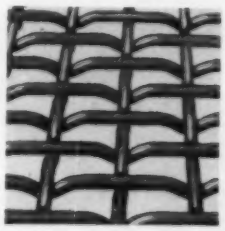
- **Hoyt SUPERTOUGH and ABRASO Wire Screen Cloth**
- **TYPES of CRIMPS**
- **SQUARE OPENING Wire Cloth**
- **LONGSLOT Wire Cloth**
- **OBLONG SPACE Wire Cloth**
- **TYPES of EDGES**
- **STAINLESS STEEL Wire Cloth**

Plus

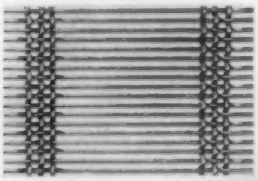
- **Valuable information on economical ordering, practical recommendations on installation, and useful specifications and calculation tables.**

FOR MAXIMUM ECONOMY AND DURABILITY SELECT FROM THESE FOUR TYPES

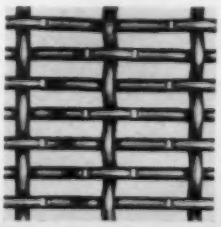
SMOOTHTOP Wire Cloth provides more wearing surface than any other type of construction.



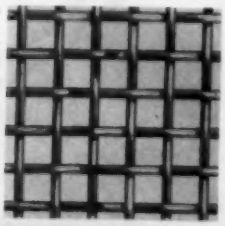
LONGSLOT Wire Cloth has a maximum amount of open area for high production — accelerated screening and non-blinding action.



OBLONG SPACE Wire Cloth increases open area and reduces clogging over square opening screens.



DOUBLE CRIMP Wire Cloth has extra rigid construction and accurate sized openings. Used mostly in smaller than 1" openings.



The new Hoyt plant is manned and equipped to manufacture *the finest wire cloth for peak economy in screening costs per ton* . . . to give you *faster deliveries* and the *best all-round service.* We'll be glad to prove these points. But, right now, we want you to have our new Handbook. Fill in and mail the convenient coupon—we'll do the rest!

HOYT
AGGREGATE WIRE SCREENS

HOYT WIRE CLOTH COMPANY
LANCASTER, PENNSYLVANIA

HOYT WIRE CLOTH COMPANY
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Yes, I'd like to have a copy of your new Hoyt Handbook

Name_____ Title_____

Company _____

Address _____

ALL THE WAY TO THE PUMP YOU'LL FIND AMSCO FITTINGS

Look at the illustration. Starting with the *enclosed-type flap valve,* in the foreground, you will pass one Amsco manganese steel fitting after another . . . all the way to the dredge. Chances are the pump will be Amsco, too.

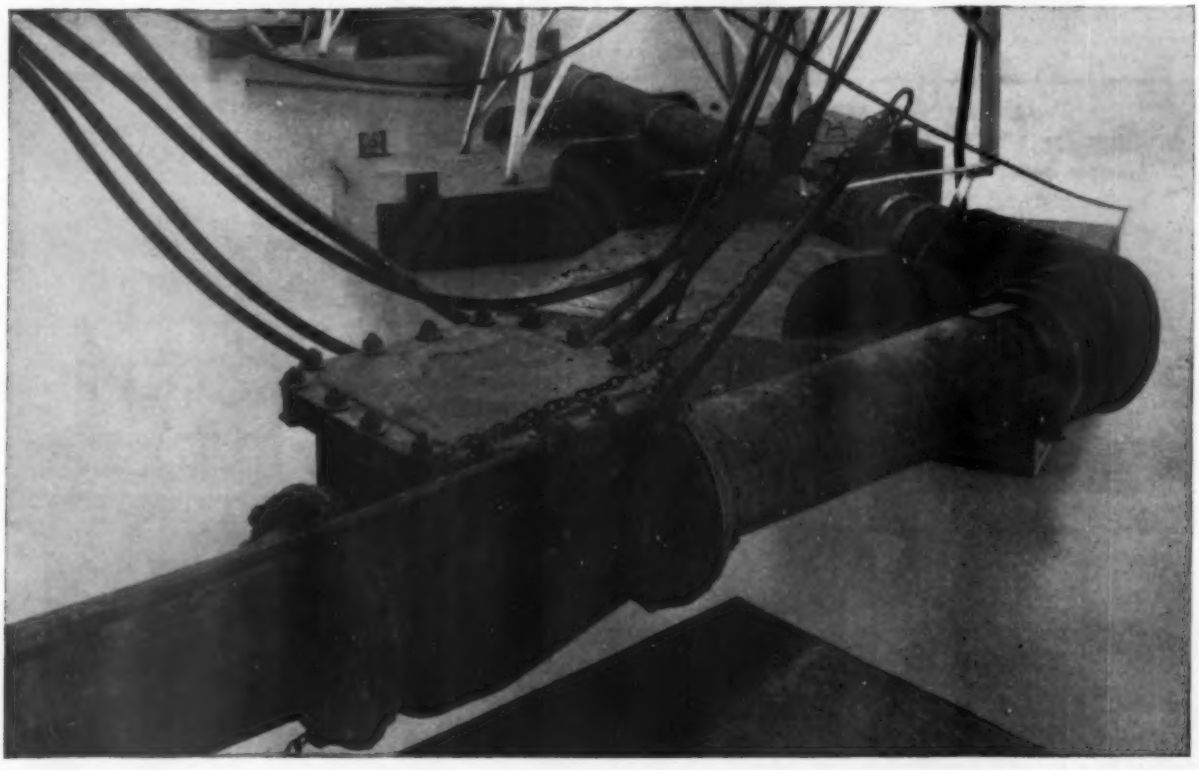
Operators everywhere are finding that for long service life under high pipeline velocities and pressures, Amsco manganese steel fittings serve best. These fittings are built to withstand both the shock of large stones and the abrasion of sand-laden water.

Manganese steel also offers a safety factor. When finally worn thin, it doesn't just break through all at once. Slow leaks give ample warning that it's time for replacement.

For pumping service and foolproof pipeline transmission, be certain you specify Amsco manganese steel . . . the toughest steel known.

AMSCO PIPELINE FITTINGS

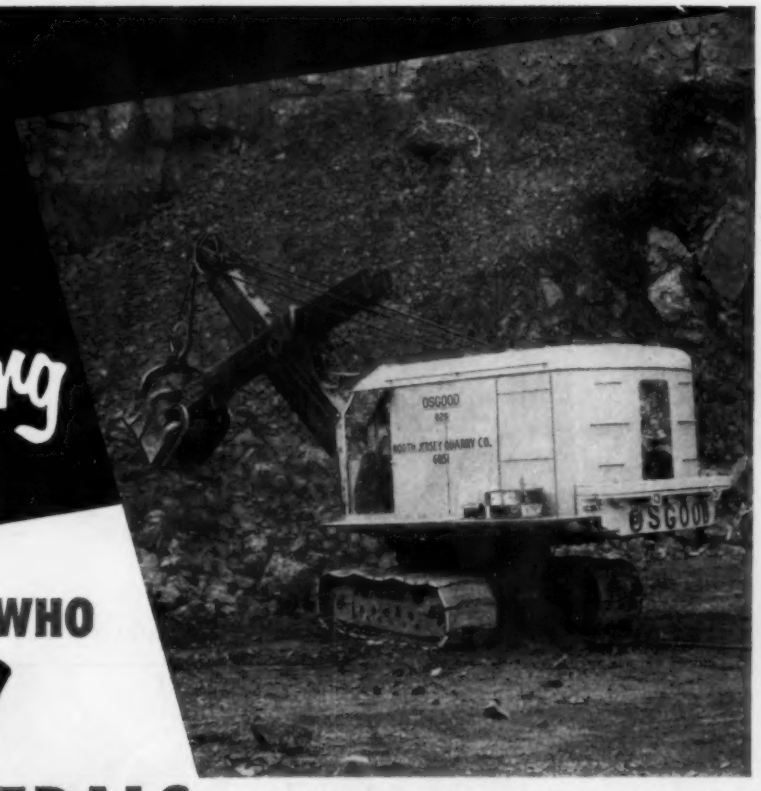
Elbow · Hose nipple · 90° Elbow · Bulkhead fitting · Open-type flap valve · Handhole fitted straight nipple · 45° long radius elbow · Straight · Enclosed-type flap valve



AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

for the proof - of the pudding



ASK THE MAN WHO OWNS // OSGOOD-GENERALS

Model 820, 1½-yard shovel at North Jersey Quarry Co. near Summit, New Jersey.

11 Osgood-Generals Work For North Jersey Quarry Company In 50th Anniversary Year

At the North Jersey Quarry Company, 11 OSGOOD-GENERAL machines are now on the production line, daily giving dependable performances that mean increased savings.

During the past 30 of their 50 years in business, North Jersey Quarry has been using OSGOOD-GENERAL machines. Says M. Hankin, Jr., Executive Vice President, "We have found OSGOOD-GENERAL equipment first class and their service of the highest quality."

It's another example of how OSGOOD-GENERAL machines, experience and engineering have paid off in money, time and labor savings.

We'd welcome an inquiry and the opportunity to provide you information that will help increase your profit through the use of OSGOOD-GENERAL equipment.

THESE OSGOOD-GENERAL MACHINES ARE DAILY ON THE PRODUCTION LINES AT NORTH JERSEY QUARRY CO.

- *three* ¾ yard Generals
- *three* 1¼ yard Osgoods
- *four* 1½ yard Osgoods
- *one* 1¾ yard Osgood

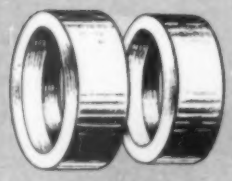
O-G OSGOOD • GENERAL

MARION, OHIO, U.S.A.

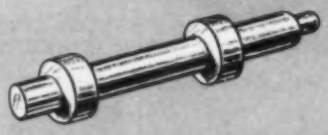
½ to 2½ cubic yards, truck cranes from 15 to 25 tons, Mobilcranes from 25 to 45 tons and log loaders.

A SUBSIDIARY OF **MARION POWER SHOVEL CO.** | MARION, OHIO, U.S.A. *1 to 60 cu. yds.*

FOR HEAVY EQUIPMENT PARTS... MIDVALE

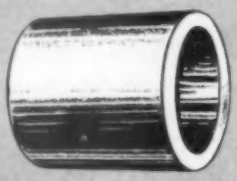


ROLL SHELLS

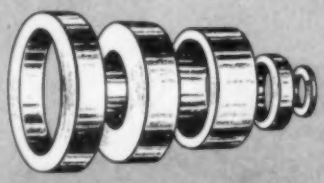


FORGED SHAFTS

TIRES



HEAVY FORGINGS



FORGED RINGS

STAINLESS CASTINGS

Midvale's complete facilities for making carbon, alloy and stainless steel forgings and stainless steel castings offer you a dependable source of supply for maintenance parts on your heavy equipment. Midvale engineers' knowledge and vast experience in designing and forging parts for mining and rock products equipment is available to help you solve your operating maintenance problems. Next time ask for Midvale's engineering and metallurgical service.

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P&H MAGNETORQUE* gives highway work a new PUSH!

Friction-free swing speeds up digging cycle— gives you 20% more output.

BIGGER PRODUCTION FOR THE BIG ROAD JOBS AHEAD!

Make no mistake — outdated designs can't compete with these modern P&H machines! This is the time to convince yourself!

Watch a Magnetorque-equipped machine go through its paces. Note the smoother, faster swing! Compare the yardage! And remember, there's no time out for pampering swing friction clutches. P&H Magnetorque does it electro-magnetically. No friction — no wear. No bothersome adjustments. Magnetorque lasts the life of your machine.

Strength? These machines are built as only P&H can build them — all welded throughout of tough, rolled alloy steels.

They're ROCK RATED . . . ready for the repeated shock loads that wear down less rugged machines.

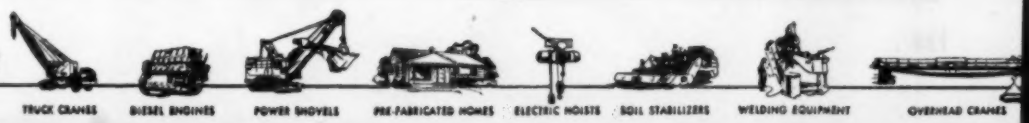
Ask us to tell you where you can see the nearest P&H 955-A or 1055 at work.

P&H POWER SHOVELS AND CRANES

HARNISCHFEGER CORPORATION MILWAUKEE 46, WISCONSIN

*T.M. of Harnischfeger Corporation for electro-magnetic type coupling.

the P&H Line



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"Mack Trucks are a definite asset to our growth and progress..."

That's the way George T. McCarthy, president of The Silliman & Godfrey Co., of Bridgeport, Conn., feels about his present fleet of Mack trucks and about the Macks his firm has purchased through the years.

Commenting on his recent purchase of two Mack Model LJ six-wheelers, he says: "The foresight of Mack engineering has given us trucks particularly adapted to the severe demands of concrete-mix operations. We have been especially impressed with the Mack engine and the Mack bogie, both of which are unequalled for this type of service. Our drivers have often remarked about their feeling of safety in knowing that reserve power is there when you need it."

As in the case of The Silliman & Godfrey Company, Mack trucks can be a definite asset to the growth and progress of *your* business, too. Get the full story from your nearest Mack branch or distributor. Mack Trucks, Empire State Building, New York 1, New York.

2638

drainage of the conglomerate and also to facilitate the unloading operations. On the date of the accident Bledsoe backed his truck to the stockpile. While it was in a loading position, a truck owned by Dunagan, loaded with wet gravel from the washer, backed to the edge of one of the stockpiles and ran over Bledsoe's body, causing his death, The driver of the truck which ran over Bledsoe did not see him until after the accident.

The lower court considered all of the evidence and held Dunagan liable in heavy damages to Bledsoe's dependents on the grounds that Dunagan was negligent because he failed to furnish and maintain a safe, wide, roomy, and adequate driveway for trucks operating between the washer and the stockpiles; that Dunagan failed to furnish a watchman to warn customers of the approach of loaded trucks traveling between the washer and stockpiles; and that Dunagan permitted the accumulation of loose gravel over the area which the stock trucks were required to back over and through in unloading operations. The higher court approved the verdict, saying:

"The deceased (Bledsoe) was upon plaintiff's (Dunagan's) premises on a business transaction. Dunagan owed Bledsoe, as an invitee, the duty to take reasonable care to keep the premises in such a state that the invitee (Bledsoe) would not be unreasonably exposed to a known danger. Moreover, it was difficult to back into the stockpile if the wheels of the truck were not kept in the ruts. Under this proof we are of the view that plaintiff (Bledsoe) established Dunagan's negligence."

Collision Policy Not Effective

According to a late higher court decision, if an automobile owner fails to exercise ordinary care to protect his damaged automobile against further damage after he has an accident, he cannot recover damages or payment from an insurance company under a collision clause.

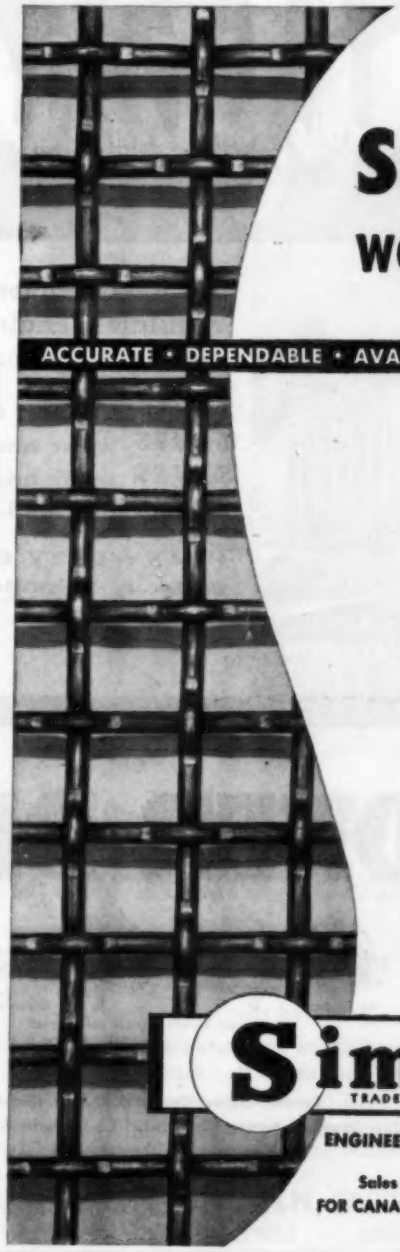
For example, in *Calvert Fire Insurance Company v. Robinson,* 226 S. W. (2d) 326, it was shown that when one Robinson was driving his automobile along a road, the wheels of a gravel truck passing in the opposite direction threw a "large" rock into the path of his automobile. Robinson heard the sound of metal under said automobile and he did not stop, but proceeded for two miles until the motor of his automobile stopped running. A subsequent examination by a mechanic disclosed that the rock had forced the oil pan against the oil line and cut off the circulation of oil to the motor, with the result that the motor had "frozen" for lack of lubrication.

In subsequent litigation the higher court held that Robinson's negligence in failing to stop and examine his automobile, after knowing that the rock had struck his car, was the proximate cause of the damage.

The higher court held that neither the truck owner nor the insurance company is liable to Robinson for damages to his automobile, and said:

"It is our opinion that the insurance policy in the case before us does not cover the damage that resulted from operating the automobile after the "collision" with the rock. Robinson knew that the rock had come in contact with the under-carriage of his automobile, where there are a number of vital parts, such as the crankcase, transmission, differential, gasoline line, brake lines, shock absorbers, etc. He made no effort to ascertain what damage had occurred but continued along his way. Under the circumstances, we think that ordinary prudence would have required Robinson to exercise some effort to determine whether the collision had damaged the working parts of the automobile."

For comparison see *Haik v. United*



SIMPLICITY

WOVEN WIRE SCREENS

ACCURATE • DEPENDABLE • AVAILABLE FOR IMMEDIATE DELIVERY

Simplicity woven wire screens are accurately woven from high grade wire into strong, tough industrial cloth. Edges can be formed and banded to fit any type of equipment used for virtually every sizing, separating or screening operation. These screens are specifically designed and woven to give long dependable service and accurate sizing of all aggregates including limestone, gravel, sand, ore, clay and cinders. Simplicity screens in a choice of wire gauges and a wide range of openings are available for immediate delivery from large stocks in our warehouses. For further information, consult a Simplicity sales representative or write for Catalog No. 66.

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GARDNER-DENVER
600-ft. PORTABLES
set new economy records with the
"Thriftmeter"

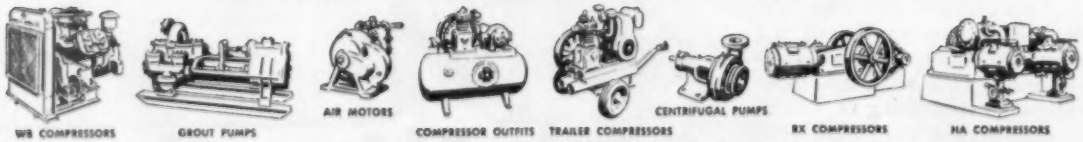
The new Gardner-Denver "Thriftmeter" regulates engine and compressor speeds according to air demand . . .

SAVES gallons of fuel every day
SAVES wear and tear on engine
SAVES wear and tear on compressor
SAVES lubricating oil

HEAVY-DUTY ENGINE provides full capacity at moderate speeds.

SINCE 1859

GARDNER-DENVER



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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

States Fidelity & Guaranty Company, 15 La. App. 97, 130 So. 118. In that case the oil line of an automobile was damaged when the auto ran into a depression in the highway. The motorist immediately called a mechanic, who advised him that it would be safe to drive the automobile home. On the way home the motorist stopped at a service station or garage and had the oil changed. Nevertheless, the motor "froze" becauseof lack of oil circulation.

The higher court allowed recovery under a collision insurance policy saying that the insured had exercised every reasonable precaution to "protect" the automobile after the collision.

"As Is" Contract

Considerable discussion has arisen from time to time over the legal question: Can a seller avoid all liability for injuries to the purchaser of a defective motor truck to be used for transporting nonmetallic materials, if such purchaser signed a sale contract having an "as is" clause? According to a late higher court decision, the answer is yes.

The courts hold that ordinarily a seller has a legal duty to use reasonable care to deliver safely to the buyer merchandise for the purpose for which it is intended; yet the legal duty of a seller, and consequently the liability, may be modified by contract. Hence, an "as is" clause in the sale contract ordinarily relieves the seller from future liability.

For illustration, in *Pokra v. Wade Motors, Inc.*, 63 N. W. (2d) 720, it was shown that one Pokra purchased a motor vehicle from the Wade Motors. The sale contract contained a clause, as follows: "The undersigned purchaser states that he has examined it and is familiar with its condition and is buying it "as is", and with no guaranty as to condition, model, or mileage. No oral representations have been made to the purchaser, and all terms of the agreement are printed or written herein. . . ."

A few days afterward Pokra was severely injured. Driving at about 55 miles per hour, he was unable to stop in the midst of traffic and ran off the road. Pokra brought suit against Wade Motors for damages.

The jury decided that Wade Motors delivered to Pokra a motor truck not equipped with efficient brakes, that such vehicle was imminently dangerous when operated upon the highway, that Pokra was not guilty of any contributory negligence at the time of the collision, and that he did not know that the brakes were not efficient. The jury gave judgment in favor of Pokra for heavy damages. The higher court reversed the verdict, and said:

"We can find no duty or breach in this case because plaintiff (Pokra) bought the vehicle "as is" without guaranty as to condition, thereby, as between themselves, releasing defendant (Wade Motors) from responsibility for such defects as it might have and himself assuming the risk. Having taken it subject to such defects as it might have, he cannot throw liability arising out of its defects back on the seller. We see no reason in public policy why the parties may not, as between themselves, make such a contract, and that they did so here is undeniable."

This court also indicated that Pokra could not recover damages based on the reduced value of the wrecked truck or the cost of repairing it.

Overload Law Is Valid

Another reader asked: "Is a state law valid which specifies how much sand and gravel can be hauled over the highways by truck owners? Can heavy fines be collected from truck owners who violate this law? Last month a higher court answered these questions in the affirmative.

For illustration, in *State v. S—*, 62 N. W. (2d) 403, the testimony showed facts, as follows: The E. L. Sand & Gravel Company, Inc., was charged with two separate violations

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to cut costly downtime

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of a state law which limits the weight of loads to be hauled over the highways of the state. The penalties for overloading are graduated so that the greater the overload the greater the fine provided. It was not disputed that the trucks were overloaded, nor was there any dispute as to the extent of the overload. Two separate fines, one of $267.20 and the other of $868.50 were imposed upon the company by a lower court.

The company's lawyer appealed to the higher court on the contention that the state law is unconstitutional in that it provides for excessive fines.

The higher court held the state law valid and approved the lower court's fines, saying:

"No claim is made that the penalties were so excessive in the present cases that the defendant will be forced out of business. The evident purpose of overloading is profit, and the greater the overload the greater the profit if the operator is not detected sufficiently often and the penalty is not sufficiently severe to make overloading unprofitable. A greater fine, as the statute imposes, does not appear to us to be unreasonable nor excessive even in its higher brackets."

The company's lawyer also contended that the law applicable to private companies is void because trucks owned by counties and municipalities are exempt from the statute.

The higher court refused to hold the statute void. This court explained that in determining whether a fine authorized by a state statute is excessive, due regard must be had to the object designed to be accomplished, to the importance and magnitude of the public interest sought to be protected, to the circumstances and the nature of the act for which it is imposed, and in some instances, to the ability of accused to pay. In order to justify the court in interfering and setting aside a judgment for a fine authorized by statute, the fine imposed must be so excessive and unusual, and so disproportionate to the offense committed, as to "shock public sentiment" and violate the judgment of reasonable people concerning what is right and proper under the circumstances.

Heavy Penalty Upheld

Recently a higher court held that a lower court may use its own discretion when imposing a penalty on a carrier for violating the minimum rate established by a Public Service Commission.

For example, in *People v. Alves*, 267 Pac. (2d) 858, a suit was filed against a common carrier for violation of the Highway Carrier's Act by transporting products at rates less than those established by Public Utilities Commission. The state law provides a penalty of not more than $500. The lower court ordered the carrier to pay a penalty of $250 for each violation. The higher court approved the verdict, stating important law, as follows: "From the fact that defendant (carrier) had charged less than the minimum rate fixed by the commission, it naturally followed that defendant had violated the act and a cause of action was established. The trial court imposed half the maximum penalty under each count. We find no abuse of the discretion lodged in the trial court in determining the penalty. There is no requirement that intent to violate the act be shown."

Dealer Is Responsible

A few weeks ago a higher court held that a motor truck seller may be liable for injuries sustained by a purchaser of a defective truck, if the testimony shows that the dealer's negligence caused the injury.

For example, in *A A Motor Company v. Milby*, 210 Fed. (2d) 137, the testimony showed facts, as follows: The driver, named Milby, of a new truck was seriously injured in a wreck allegedly caused by a defect in the mechanism. Milby sued the automobile manufacturer for heavy damages, and also testified that the dealer's negligence caused the wreck.

It is interesting to observe that the higher court held that Milby could in the same suit include the dealer, and if the testimony showed that he was negligent in failing to discover and repair the defect in the truck, the dealer is liable; but if the manufacturer was negligent, the latter is liable to Milby for damages. The higher court said:

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The Schramm Pneumatractor with new Backhoe and Loader gives you a 125 c.f.m. air compressor . . . tractor . . . backhoe . . . shovel . . . loader . . . crane . . . sweeper . . . snow plow . . . bulldozer . . . backfill tamper . . . platform scaffold . . . winch . . . auger . . . wagon drill!

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"We think, that in the interest of the prompt disposition of this litigation, there is no legal objection to permitting the Richmond Motor Company (dealer) to be brought in as a third party defendant."

Donated Truck

According to a late higher court decision, a quarry operator, or other, who donates a motor vehicle for charitable purposes is liable for negligence of the operator or driver.

For example, in *Heit v. Krueger*, 265 S. W. (2nd) 655, it was shown that one Heit donated a motor truck and its driver to assist in a city "clean up" drive sponsored by a civic nonprofit organization. The truck collided with an automobile, seriously injuring its occupants, who sued Heit for heavy damages.

The lower court refused to hold Heit liable on the grounds that the driver of the truck was not at the time and place of the accident acting as an agent of Heit but as an employee of the civic organization. However, the higher court reversed this decision and explained that an employer is liable for the negligence of his employee if the injurious act is done in obedience to his express orders or directions, even though the service is not within the line of the employee's usual duties. This court said, "A servant of one employer does not become the servant of another for whom the work is performed merely because the latter points out to the servant the work to be done, or supervises the performance thereof, or designates the place and time for it."

Lien Not Forfeited

According to a late higher court decision, a mechanic's lien is not forfeited when a materialman gives a property owner a full release through an error.

For example, in *West v. Jarvi*, 266 Pac. (2d) 1040, it was shown that the P— Sand & Gravel Company supplied to one West, a property owner, materials of a total value of $850.33, to be used in the construction of West's building. Delivery began October 28, and within five days thereafter the sand and gravel firm complied with a state law by notifying West of its intention to claim a lien. Materials valued at $331.83 were delivered prior to December 15, and on that date West made a payment of $69.60, leaving a balance of $262.23. The remainder of the material was delivered between December 15 and December 30. On January 23 the company mailed a notice to West stating that $262.23 was due for materials. No further payment

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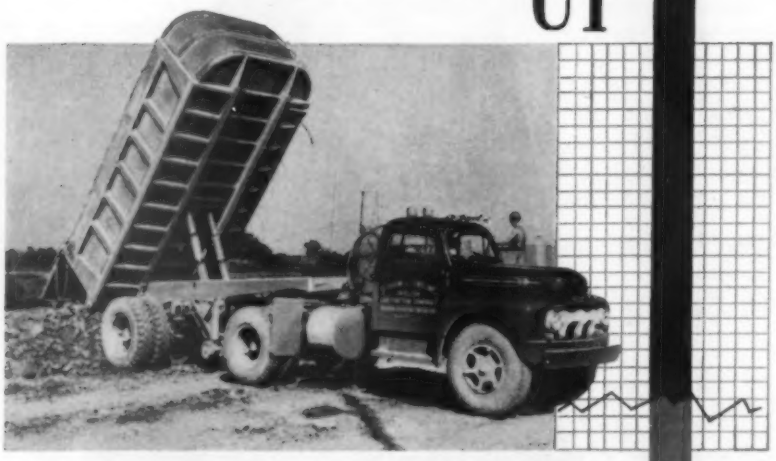

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Marion all-welded trailer bodies are constructed to minimize sagging or twisting when loads are uneven or extra heavy.

Marion Telescopic hoists are made of heavy, seamless steel tubing polished to a mirror-like finish to greatly reduce wear. The jacks are connected to the frame in such a way as to prevent binding. They are designed to give equalized lifting power, regardless of the load. Stability is maintained by rigid underbody construction.

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being received, the company filed its lien claim in the amount of $262.23 on January 26.

On the same date the firm sent West a letter advising her that the lien had been filed and that the amount of the account was $262.23, plus a filing cost of $5.90, but that the extra charge would be canceled if she paid the $262.23 within 30 days. This she did, and the company executed a release of its lien. In other words, the firm believing, through an error in its book accounts, that West owed only $262.23 for material, gave West a full release on liens for materials.

The company later discovered the error and on March 30, within the 90-day statutory period following the last delivery of material, it filed a second claim of lien, this being for the amount still due, $518.50.

West argued that as the firm had given her a full release on the liens for supplied materials, this release forfeited its legal right to file any other lien. The higher court refused to agree with this contention, and said:

"While the argument advanced by appellant (West) that if a lien is paid and satisfied, the force of the five-day notice is spent, is novel and ingenious, we are satisfied that it is not sound. Such an interpretation would serve no good purpose, would thwart the legislative intent, and would enable property owners to defeat lien claims for materials and services of which they had received the benefit. Stated briefly, our holding on this point is: The filing of a lien by a materialman for less than the amount due, and the satisfaction of that lien, do not affect the force and effect of the notice, and a second lien covering the amount still due will be enforced if filed within the statutory period following the last delivery of materials."

Law of Addition and Deduction Clauses

Considerable discussion has arisen from time to time over the legal question: What is the legal significance of "addition" and "deduction" clauses in a construction contract?

Recently a higher court clearly held that the legal meaning of such clauses is entirely dependent upon the original intentions of the contracting parties.

For example, in *F. H. McGraw & Company v. New England Foundation Company, Inc.*, 210 Pac. (2d) 62, it was shown that a general contractor and a subcontractor entered into a subcontract for the placement of piles and caissons in certain foundation work. The testimony showed

that the term "piles" means steel shells driven into the ground and filled with concrete, both remaining in the ground. The term "caissons" means steel shells driven into the ground and filled with concrete, but the steel shells in this case are removed.

The contract contained this clause: "Should the quantities of cast-in-place concrete piles or concrete-filled caissons be increased or decreased by order or approval of the engineer, from those based on the assumed rock surface, the undersigned agrees that the following unit prices shall be the basis of payment to him or credit to the owner for such increase or decrease, except that such adjustment prices shall not apply to entire items which may be included or omitted."

In the suit that developed over payment to the sub-contractor the higher court held as follows: "We believe that these provisions reveal that the parties only intended the 'additions and deductions' clause to apply to minor variations between the assumed and the actual quantities necessary for the placement of 60 piles and caissons."

Husband Solely Liable

According to a late higher court decision, joint owners of real estate are not liable for damage to adjoining real property done by only one of the joint owners.

For example, in *Connor v. Grosso*, 259 Pac. (2d) 435, it was shown one Grosso and his wife jointly owned certain land. Grosso dumped upon adjoining real property 3,184 cu. yd. of dirt, rocks, and other debris. The cost of removal of this material was $4,362.08.

In subsequent litigation the higher court refused to hold Grosso and his wife jointly liable, and said, "The fact that Paul Grosso was her husband and that he held the property with her as a joint tenant does not establish her liability."

Avoid Ambiguous Employment

All courts agree that officials and employees who work under written employment contracts will do well to be certain that such contracts have a clear and understandable meaning, and not an ambiguous meaning. This is so because very often the court will construe an ambiguous employment contract against the employee.

For example, in *Read Company v. McAtee*, 268 Pac. (2d) 1108, the testimony showed facts, as follows: a man named McAtee signed a contract with a corporation under which he was to receive a salary of $600 per month "plus 10 percent of the first $80,000 of the earnings of the company each year." The salary of $600 per month was paid to McAtee monthly, but upon the dissolution of the business on March 31 he claimed that under the provisions of the contract he was entitled to additional compensation of 10 percent of the profits of the corporation accumulated as of March 31, which the corporate records showed to be $69,372.04.

The higher court explained that if McAtee was to collect 10 percent additional compensation, plus his regular $600 per month salary, the agreement should have so stated. The higher court held that McAtee was entitled to receive only $2,000, which is ¼ of $80,000, the commission McAtee would have received had he worked the full year for the corporation. This was so because McAtee's services to March 31 is only ¼ of a year.

The court said, "The resolution was ambiguous. McAtee is hired on a yearly basis to perform personal services at the rate of $600 per month, plus an additional compensation of 10 percent of the yearly profits not in excess of $80,000. His percentage compensation is based upon yearly profits, not quarterly profits."

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Gentlemen:

Last summer we purchased a set of your 8" Molloy Bits.

We have used these bits on a number of wells in the San Andres lime which is a very hard formation and a good formation to test the quality of steel in bits. Our experience with the Molloy Bits has been quite satisfactory and so far we have not jumped a pin off of these bits. With other bits we ordinarily jump one or more pins on each well we drill.

These bits stand up for a longer period of time and consequently do not have to be dressed as often. They have presented no problems in dressing or tempering. We use natural gas or butane in our forges.

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traffic news

CENTRAL TERRITORY RAILROADS
Freight Traffic Committee

Docket 90810 (1)—Proposed to establish a rate of 72 cents per net ton on all kinds of sand in carloads, open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to visible capacity, actual weight will apply from Carey, Ohio, to Findlay, Ohio. This rate is subject to X-175-B increase.

Docket 90818 (2)—Proposed to establish a rate of 300 cents per net ton on roasted dolomite (refractory dolomite, in granular form, treated or untreated, clinkered and/or burned to a dead state) from Narlo and Maple Grove, Ohio, to Fort Wayne, Ind. Minimum weight of a carload is 90 percent of marked capacity of car, except when car is loaded to visible capacity, in which case actual weight will apply.

Docket 90828 (1)—Proposed to establish on crushed stone and crushed stone screenings, in bulk, in open-top cars, carloads, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from St. Paul, Ind., to the following points in Michigan:

Grand Rapids	203 cents net ton
Kalamazoo	193 cents net ton
Sturgis	183 cents net ton
Three Rivers	188 cents net ton

Docket 90833 (1)—Proposed to establish on lime, common, hydrated, fluxing, quick, slaked or fibered (except agricultural), in carloads from Scioto, Ohio, to Teays, Ohio, 23 cents minimum 15 tons, and 21 cents minimum 25 tons.

Docket 90873 (1)—Proposed to establish on gypsum rock, crushed (not ground); gypsum rock, run of mine, carloads, minimum weight 90 percent of marked capacity of car except when car is loaded to full cubical or visible capacity, actual weight will apply, but not less than 30 tons, from Raney Spur, Ind., to the following points:

	Open Top Cars Not Protected by Covering	Closed Cars or Protected with Covering
Bay Bridge, Ohio, Cement City, Mich., Fultonham, E. Fultonham, Fairborn, Ironton, Middle Branch, Superior, and Toledo, Ohio, and Wyandotte, Mich.	381	414
Detroit, Mich.	441	474
Limedale, Ind., Speed, Ind.	264	297
St. Louis, Mo.	327	360

EASTERN RAILROADS
General Freight Traffic Committee

Bulletin N 1609-36 (Carrier)—Proposed to establish rate of $7.15 per net ton in open cars and $7.64 per net ton in closed cars on limestone, natural, ground or pulverized, carload minimum weight 30 tons from Buchanan, Va., to LaPlatte, Nebr. Subject to ExParte 175-B increase.

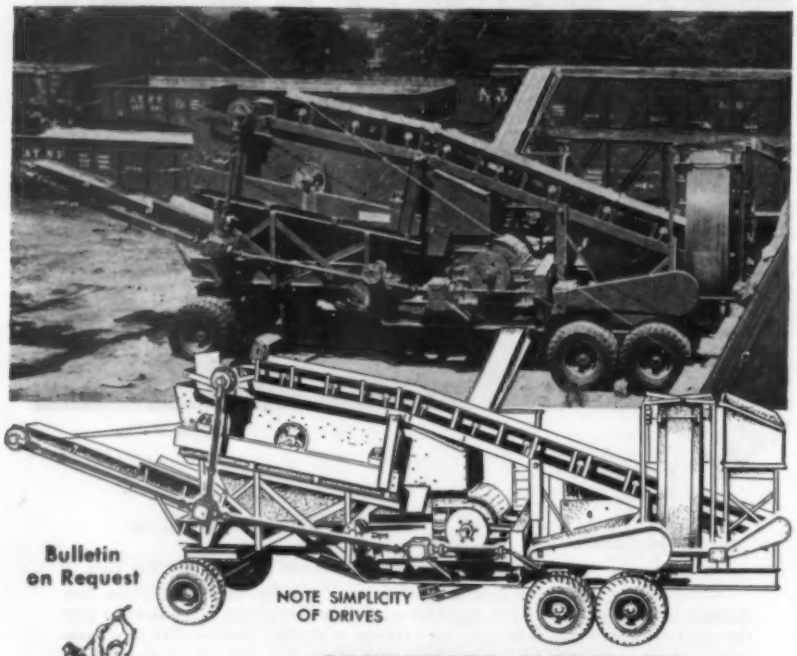
Bulletin C 1609-37 (Shipper)—Proposed to establish on limestone, crushed, ground or pulverized, not burned, in 30-ton carloads from

MANUFACTURERS OF ROCK CRUSHERS SINCE 1885

ENCLOSED DRIVES! MOISTURE, DUST AND ROCK CANNOT DISTURB GEARS or DRIVES

UNINTERUPTED CRUSHING

HIGH PRODUCTION — PRODUCES BOTH AG-STONE & ROAD ROCK



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GRUENDLER MODEL 110
MOBILE CRUSHING PLANT
with famous 3xD Gruendler Two-In-One Hammermill

Designed for 30 T.P.H. on AG-LIME and 100 T.P.H. on AGGREGATES. Ample CONVEYOR and SCREEN capacity plus enclosed roller bearing equipped drives-gears, features to almost double it's rated capacity.

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Carey, Ohio, to Hamilton, Ont., $4.46 per net ton in open cars and $4.95 per ton in closed cars; and to Toronto, Ont., $4.90 per net ton in open cars and $5.19 per net ton in closed cars.

Bulletin C 1609-38 (Shipper)—Proposed to establish on limestone, natural, ground or pulverized, unburned, in open and closed equipment, minimum weight 30 tons, from Woodville, Gibsonburg, Maple Grove (Narlo), and Millersville, Ohio, to McClure, Va., $3.71 per net ton in open-top cars and $4.20 per net ton in closed cars; to Moss and Date, Va., $3.83 per net ton in open-top cars and $4.32 per net ton in closed cars. Rates are subject to ExParte 175-B increase.

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-1417—Proposed to establish a rate of 88 cents per net ton from Anna, Ill., and 93 cents per net ton from Ullin, Ill., on carloads of crushed stone in open-top cars to Illinois Central Railroad stations DeSota through DuQuoin, Ill. These rates are subject to ExParte 175-B increase. Minimum weight of car, 90 percent of marked capacity of car, except when car is loaded to visible capacity, in which case actual weight will apply.

Docket IRC 511-1423 (MRP 7267)—Proposed to establish a rate of $2.89 per net ton in open-top cars on crushed stone, carloads, minimum weight 40 tons, from Waterloo, Wis., to Burlington, Ft. Madison, and Keokuk, Iowa, and intermediate stations and $3.38 per net ton in closed cars. Rates subject to X-175-B increase.

Docket IRC 511-1427 (MRP 7277)—Proposed to establish a rate of 122 cents per net ton on agricultural limestone, carloads, from McCook, Bellwood, and Harvey, Ill., to Green Valley, Winkel, and San Jose, Ill. Rate subject to X-175-B increase.

NORTH PACIFIC COAST FREIGHT BUREAU

Docket NC 1214 Supplement 1—Proposed to request a rate of 3 cents per hundredweight on crushed rock, carloads, from Centralia, Wash., to Kalama, Wash., minimum weight 50 tons. Rate not subject to X-175-B increase.

Docket NC-4340 (S)—A rate of 9 cents per hundredweight has been requested on stone, crushed or pulverized, carloads, from Chewelah, Wash., to Nelson, B. C. Minimum weight 40 tons.

Docket X NC 4349 (S)—Request a rate of 13 cents per hundredweight on limestone in open-top cars not protected by tarpaulin or other protective coverings, carloads, from Ione, Wash., to Scalley, Wash. Minimum weight 40 tons.

SOUTHWESTERN FREIGHT BUREAU

Docket 69749 (S) — Proposed to establish a rate of 680 cents on perlite rock per net ton from Socorro, N. M., to Rapid City, S. D. Rate not subject to X-162-6-8 increases.

Docket 69781 (s) — Proposed to establish rates of 427 cents per net ton in open cars and 475 cents per net ton in closed cars on crushed stone from Berthoud, Lyons, and Wild's Spur, Colo., to Dimmitt and Silverton, Tex.

Docket 69904 (S) — Establish a rate of 861 cents per net ton on perlite rock from Socorro, N. M., to Port Clinton, Ohio. Rate not subject to X-162-6-8 increases.

A fire at Acme Materials, West Tulsa, Okla., caused an estimated $165,000 worth of damage. The loss to the buildings was about $15,000, and to machinery $150,000.

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Lakeland Engineering Associates' proven prestressed concrete product designs are now available for manufacturing under a LEAP exclusive franchise.

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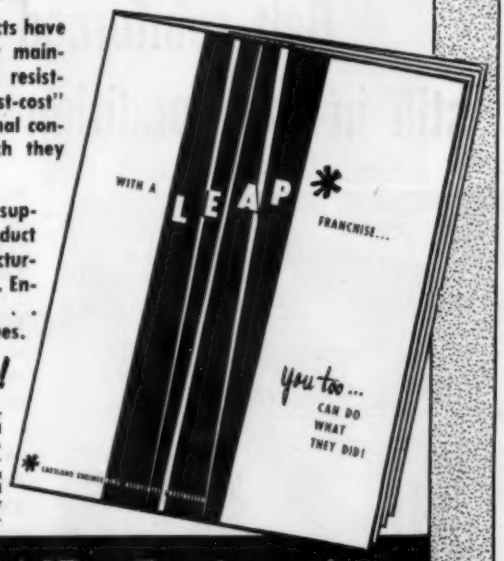

LAKELAND *Engineering*
ASSOCIATES, INC.
LAKELAND, FLORIDA

At Palisades Dam . . .

Belt reinforced with Du Pont "Cordura" still in top condition after 14 months' hard service

Reinforced with Du Pont "Cordura," this 45° slope belt hugs the idler for better troughing and training throughout its run.

Palisades Contractors, Palisades, Idaho, put the conveyor belt shown above through rugged 96-hour work weeks for 14 months—and it's still going strong.

The belt, reinforced with Du Pont Cordura* High Tenacity Rayon, carries 530 yards of earth per hour when in steady operation . . . can handle up to 1,800 tons per hour of large and small rocks, some up to 28 inches. Manufactured by Raybestos-Manhattan, Inc., the belt has needed little maintenance since its installation. Du Pont "Cordura" has *extra* strength . . . permits a belt that's thinner yet stronger. And the low stretch of "Cordura" reduces expensive downtime for take-up and resplicing.

Why not consider "Cordura" before ordering your next conveyor belt? Write us for names of suppliers . . . and send for your *free* copy of the new booklet "Mine & Quarry Facts About 'Cordura'." Address: Textile Fibers Department, Room 11506P, E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Delaware.

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Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

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ALLIS-CHALMERS Rubber-Lined PUMP

for easier servicing when pumping abrasive, fine-mesh materials.

Loosening of nut allows man to remove both bolt and nut in a single quick motion.

Allis-Chalmers Rubber-Lined Pumps substantially reduce your maintenance, service and downtime costs. New design permits exceptionally fast takedown and reassembly without the use of special tools.

10 to 50 times more wear

What's more, Allis-Chalmers Rubber-Lined Pumps stand up 10 to 50 times longer than hard alloy pumps, minimize equipment costs. You'll save, too, because the A-C rubber linings are bonded to a steel skeleton which is bolted to the casing. There's no possibility of lining "pop out" or deformation.

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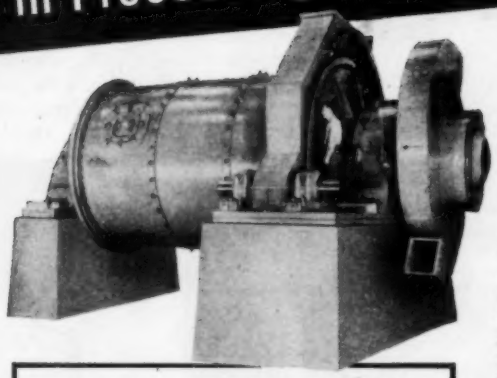
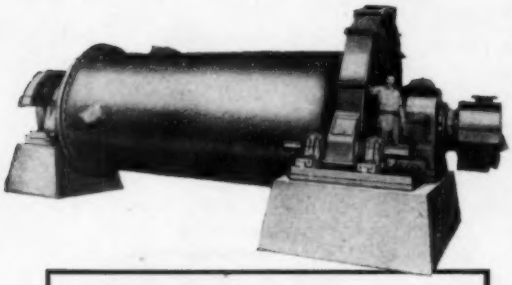
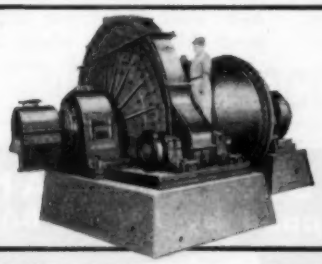
NORDBERG GRINDING MILLS
Assure Maximum Output—Low Costs in Processing of Ores, Minerals and Cement



NORDBERG 10′-8″ x 17′ Wet Grinding Ball Mill showing scoop feeder.



NORDBERG 9′-6″ x 24′ Wet Grinding Pebble Mill for non-ferrous milling.



NORDBERG 9′-6″ diameter x 11′ long Dry Grinding Mill.

MORE than half a century of progressive engineering achievement, combined with quality production in modern manufacturing facilities, have won for Nordberg a foremost position in the field of heavy machinery manufacture.

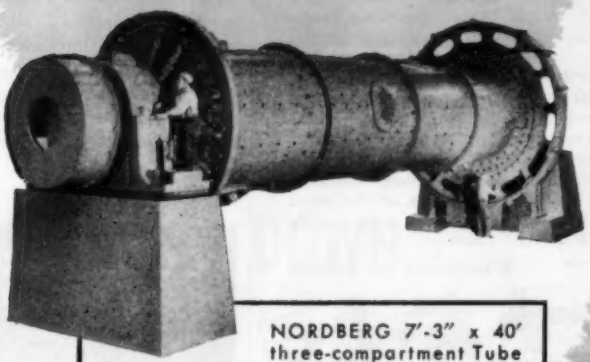
Typical of this heavy machinery is the complete line of Nordberg Grinding Mills available for the manufacture of Cement, the extraction of Metals from Ores, and in the processing of Non-Metallic Minerals, which require comminution to fine sizes.

Nordberg manufactures Ball, Tube, Rod and Compartment Mills, of grate, overflow and peripheral discharge types for wet or dry grinding service, in sizes ranging to 13′-0″ diameter, and in lengths to 40′-0″.

Competent engineering services are available for new processing plant design or modernization of existing plants.

For large or small operations, you can depend on Nordberg Machinery to deliver maximum output at lowest possible cost.

NORDBERG MFG. CO., Milwaukee, Wisconsin



NORDBERG 7′-3″ x 40′ three-compartment Tube Mill manufactured for a large cement plant.

SYMONS GYRATORY CRUSHERS

SYMONS CONE CRUSHERS

SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS

DIESEL ENGINES — 10 to OVER 10,000 H.P.

GM154

SYMONS . . . *A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD*

NORDBERG MACHINERY

NORDBERG

CRUSHERS SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

FOR THE
tough
jobs...

CARAVAN AXLES
top them all!

Built for action . . . not coddling . . . CARAVAN axles are job engineered for endurance, safety and long life. Your product is kept on the go at lower cost when it is mounted on a CARAVAN Axle. Built to withstand maximum stress and strain, these axles excel at load stability over rough and difficult terrain. All units in this line feature a massive heavy-duty steering arm, extra-heavy center-arm stop block, heavy-duty steering knuckle and precision ground spindles. All these outstanding features are yours at the most economical price when you specify CARAVAN Axles.

8007-UM *Write today for Bulletin 53*

THE UNITED MANUFACTURING CO.
1056 INTERSTATE STREET • BEDFORD, OHIO

trade notes

Raymond Q. Armington, who has been president of Euclid Road Machinery Co., Cleveland, Ohio, since 1951, has been made general manager of the General Motors Euclid Division, following the acquisition of the company by General Motors Corp., in September, 1953. He became vice-president and general manager of the company in 1937 and was elected president in 1951.

Truck Equipment Co., 20-24 14th St., N.W., Atlanta, Ga., has been appointed distributor of Galion Allsteel hydraulic hoists and dump bodies, by The Galion Allsteel Body Co., Galion, Ohio. R. A. Garner, a veteran of 20 years in the dump body business, is president and sales director.

James W. Taylor moves up to head research, sales promotion and advertising for Kraft Bag Corp., 630 Fifth Ave., New York, N. Y., and St. Marys, Ga.

Jack How, who has been associated with construction advertising for more than 15 years, has joined John Mather Lupton Co., Inc., New York advertising agency. Mr. How has been in charge of all construction and concrete machinery advertising for Worthington Corp., for the last eight years. Before that he was in the advertising and publicity department of Caterpillar Tractor Co., Peoria, Ill.

Lee L. Morgan, former assistant sales manager, has been appointed manager, Sales Development Division of Caterpillar Tractor Co., Peoria, Ill. He joined Caterpillar in 1946 and after completing the college graduate training program served as an instructor in the Sales Training Division.

Lee L. Morgan

Louis E. Schumacher

Louis E. Schumacher succeeds L. L. Morgan as assistant sales manager, Plains Division. After joining Caterpillar in 1947 and completing the college graduate training program, Mr. Schumacher served as a district representative in the Central Sales Division and also in the Plains Sales Division.

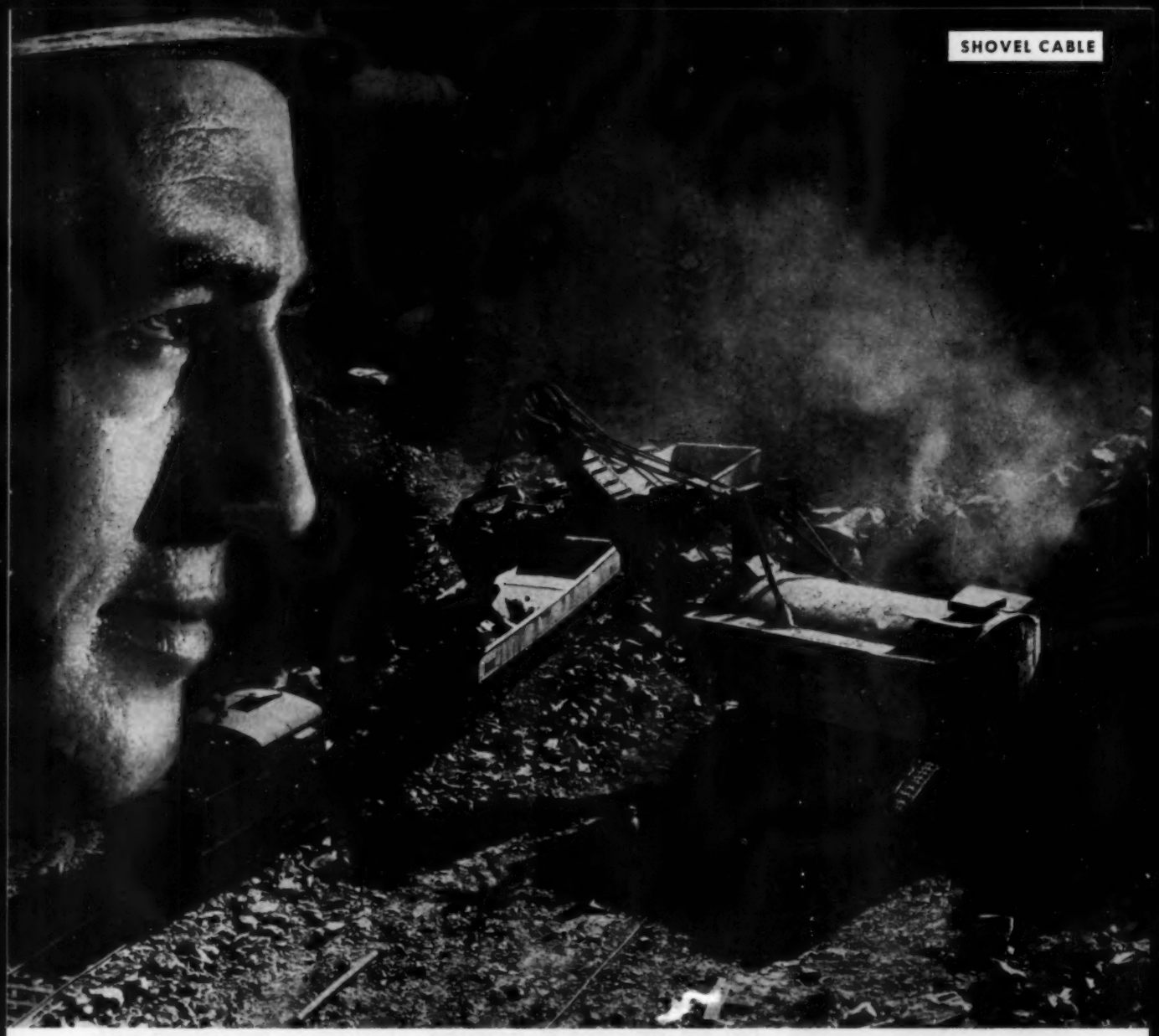
Walter St. Onge Jr. has been named advertising manager of The Torrington Co., Torrington, Conn. A member of the advertising department since November, 1953, he succeeds his father, whose retirement this fall concludes more than 31 years of service with the company.

COMPLETE CRUSHING PLANTS
designed and equipped by FARREL-BACON

Farrel-Bacon provides a complete engineering service, including design of plant and supplying all equipment from primary crusher to bin gate. Jaw-type crushers are available in sizes from 60" x 48" to 10" x 7" *Write for complete information.*

FARREL-BACON
ANSONIA, CONNECTICUT

BA-3



LONGER "TROUBLE-FREE" SERVICE is the proved record of Anaconda's Securityflex SH-D Shovel Cable in mines like this, the world over.

How AnacondA SH-D Shovel Cable helps keep downtime DOWN

A cable breaks. A shovel lies idle. Production time and profits slip away.

One break in a cheap cable can more than wipe out savings made by buying on price alone.

A far wiser buy is Anaconda's improved Securityflex* Type SH-D Shovel Cable. This rugged cable is built to keep downtime down!

Why mine superintendents praise it

A new, high-grade butyl insulation withstands heat, moisture and ozone. New neoprene jacket is tougher and more abrasion resistant. Rubber cores cushion the ground wires . . . help prevent breaks.

Run Securityflex Shovel Cable over rocks—if you must. See how it holds up. Securityflex is flexible . . . easy to handle . . . safer . . . less liable to "blow-out."

Try Securityflex in your mine

Securityflex Type SH-D Shovel Cable has a proved record of safety and economy in mines all over the world. Chances are it can cut downtime and costs in *your* mine, too. See your Anaconda Sales Office or Distributor for further information. *Anaconda Wire & Cable Co., 25 Broadway, N. Y. 4, N. Y.*

*Reg. U. S. Pat. Off. 54342

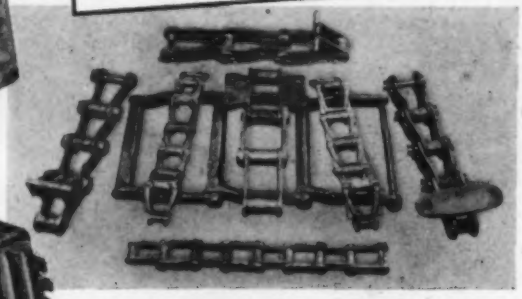
ANACONDA®

Flat-twin cables for shuttle cars, continuous miners, loaders, cutters, drill trucks. Hi-volt cables for mine power • Type SH-D for shovels • Type SO and heavy-duty drill cords for hand drills, remote control • trolley wire • feeder cable • telephone wire • shot fire cord • welding cables.

Specify TISCO MANGANESE STEEL

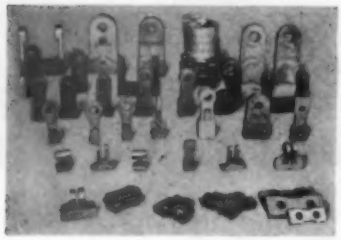
Ball Mill Liners

The longest-wearing steel for the toughest Wear Parts!



Chain for conveyors, elevators, dredges, etc.

Jaw Crusher Parts



Pulverizer and Hammermill Parts

Simply ordering "manganese steel" wear parts does not assure the fullest durability and toughness of which this great wear-resistant steel is capable.

Add the word "TISCO" to your specifications and orders. Get manganese steel at its best—produced by Taylor-Wharton, first to cast Hadfields manganese steel in America and offering the longest experience in the production and application of manganese steel to parts subject to heavy impact and abrasion.

TISCO assures the right analysis for your job—soundly cast and properly heat-treated—ground to accurate dimensions—inspected by the most modern techniques, including Gamma Rays, to insure perfect castings.

Specify TISCO Manganese Steel when ordering new equipment or replacement parts. Write for descriptive bulletins.

Repair and rebuild with TIMANG WELD ROD

Flows easily, air toughening, no quenching. Produces clean, uniform welds, equal in strength to original metal.

TW

Founded 1742

TAYLOR-WHARTON IRON AND STEEL CO.

High Bridge, N. J. — Cincinnati, O. — Birmingham, Ala. — Easton, Pa.

Carl R. Sare, 37, formerly vice-president and a member of the board of directors, has been named president of the W. W. Sly Mfg. Co., Cleveland, Ohio, succeeding Frank W. Klatt, 68, who has retired. Prior to his present association, Mr. Sare served as assistant to the president of the Patterson Foundry and Machine Co., of East Liverpool, Ohio, and as a production executive of the American Steel and Wire Division of the United States Steel Co. He began his career as a sales engineer for the A. M. Byers Co. and later the Jones and Laughlin Steel Corp.

Carl R. Sare

Ray J. Dervey

Ray J. Dervey has been appointed general sales manager of the American Hoist & Derrick Co. of St. Paul, Minn.

Mr. Dervey, a native of St. Paul, started his industrial career as a production engineer for United States Steel Co. He joined American Hoist in 1945, in the industrial equipment division at the St. Paul sales office, and was promoted to district manager in 1946, when he took charge of the Pittsburgh office and territory. He now fills the post formerly held by John Carroll, now president of the firm.

Yuba Manufacturing Co., 351 California St., San Francisco, Calif., manufacturer of bucket ladder dredges has announced its re-entry into the hydraulic dredge field. Yuba will build hydraulic dredges from 6 in. up, for such diversified uses as harbor construction, hydraulic fills, channel excavation, levee construction, and production of sand and gravel.

George Pelton, mechanical engineer, who has specialized in hydraulic dredging for more than 30 years, will have special responsibility for the company's hydraulic dredging program.

J. Robert Pauline, former division works manager, has been appointed vice-president of the Kellogg Division of American Brake Shoe Co., New York, N. Y. He started with the company as an engineer in 1943.

West Coast Engine & Equipment Co., 1077 Eastshore Highway, Berkeley, Calif., has been appointed distributor in northern California for Bucyrus-Erie Co., South Milwaukee, Wis.

D. L. Edmunds has been appointed chief engineer of Mechanical Industries, Inc., Pitsburgh, Pa. Previously he was doing general design work on U.S. Steel's Research Center at Monroeville, Pa.

J. J. Patterson Jr., a member of the organization since 1936, has been appointed to the newly created position of field sales manager of Union Bag and Paper Corp., New York, N. Y. His new duties include advising and aiding the district managers and field sales representatives on a national basis.

William W. Dipman, who joined the company in 1942, has been named Northeastern district sales manager, and William T. Bess Jr. has been named Southeastern district sales manager.

J. J. Patterson, Jr.

Robert Keach

Robert Keach has been appointed manager of the Industrial Rubber Division of Thermoid Co., Trenton, N. J., succeeding Lloyd R. Leaver, who is continuing in a consulting capacity.

Mr. Keach comes to Thermoid with a background including general plant manager of the Industrial Rubber Products Division of Firestone Rubber, and more recently, vice-president and general manager of Quaker Rubber Corp. of Philadelphia.

Chain Belt Co., Milwaukee, Wis., announces the appointment of six sales engineers to their district sales offices. The newly trained sales engineers are: Tom Jewell, Jim Collins, Deane Treat, Ray Tippett, Jerry Plant, and Henry Kozlowski. Their respective district office assignments are with Chain Belt's Milwaukee district sales, San Francisco warehouse and district sales, and sales offices in Dallas, Philadelphia, Los Angeles and Chicago.

now even better

SKF Triple-Seal "SAF" PILLOW BLOCKS

BETTER Because SKF's Type "C" Spherical Roller Bearings . . . .

Increase capacity 25% to 50%
increase service life 2 to 3½ times

The big news in bearings—news from SKF—is the Type "C" Spherical Roller Bearing—as a replacement for ordinary sphericals, size for size, lasts *2 to 3½ times longer, increases capacity up to 50%.*

This improved design is now available in SKF's famous Triple-Seal "SAF" Pillow Blocks.

You get this longer life and increased capacity *in addition* to—

- Effective sealing from dirt.
- Lubricant retention.
- Adapter mounting for tight fits on standard shafting.
- "Free" or "Held" design.
- Easy installation and inspection.
- Self-alignment.
- NO INCREASE IN COST!

YOUR SKF DISTRIBUTOR will give you complete details about the "C" bearing and a copy of SKF Bulletin No. 365 which contains technical data, sizes available, increased life and capacity you can expect for each size.

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.
—manufacturers of **SKF** *and* HESS-BRIGHT *bearings.* 7521

SKF®
BEARINGS AND PILLOW BLOCKS

30 FEET OF TRAVEL... ...SECONDS OF TURNING SAVED...

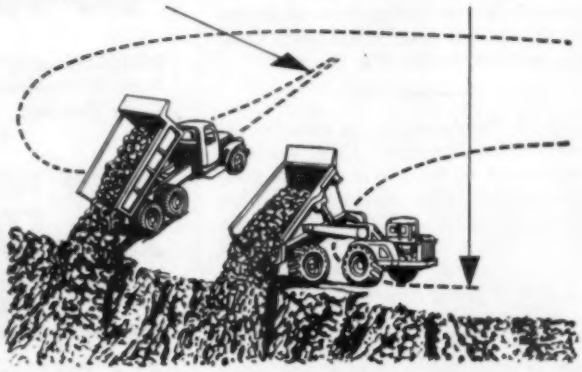
You can eliminate 30 feet of travel and 30 seconds of maneuvering with an Athey PR21 Rear-Dump Trailer. Rear-dump trucks have approximately 45° turning ability . . . it takes twice as much space *and* time to swing onto the fill, back and dump! With the PR21 you make turns of 90° under hydraulic-control. The rig can turn in less than its own length, without stopping! It can maneuver, turn and dump its 22.5 cu. yd. load on a 36-foot wide fill. The trailer can be dumped with the tractor at any angle. The 30 feet and 30 seconds that a PR21 saves can mean added production and profit!

Change your fill traffic pattern to a short, safe, profitable Athey PR21 pattern—your Athey-Caterpillar Dealer can show you how!

ATHEY PRODUCTS CORPORATION

5631 West 65th Street Chicago 38, Illinois

NOT THIS . . . BUT THIS

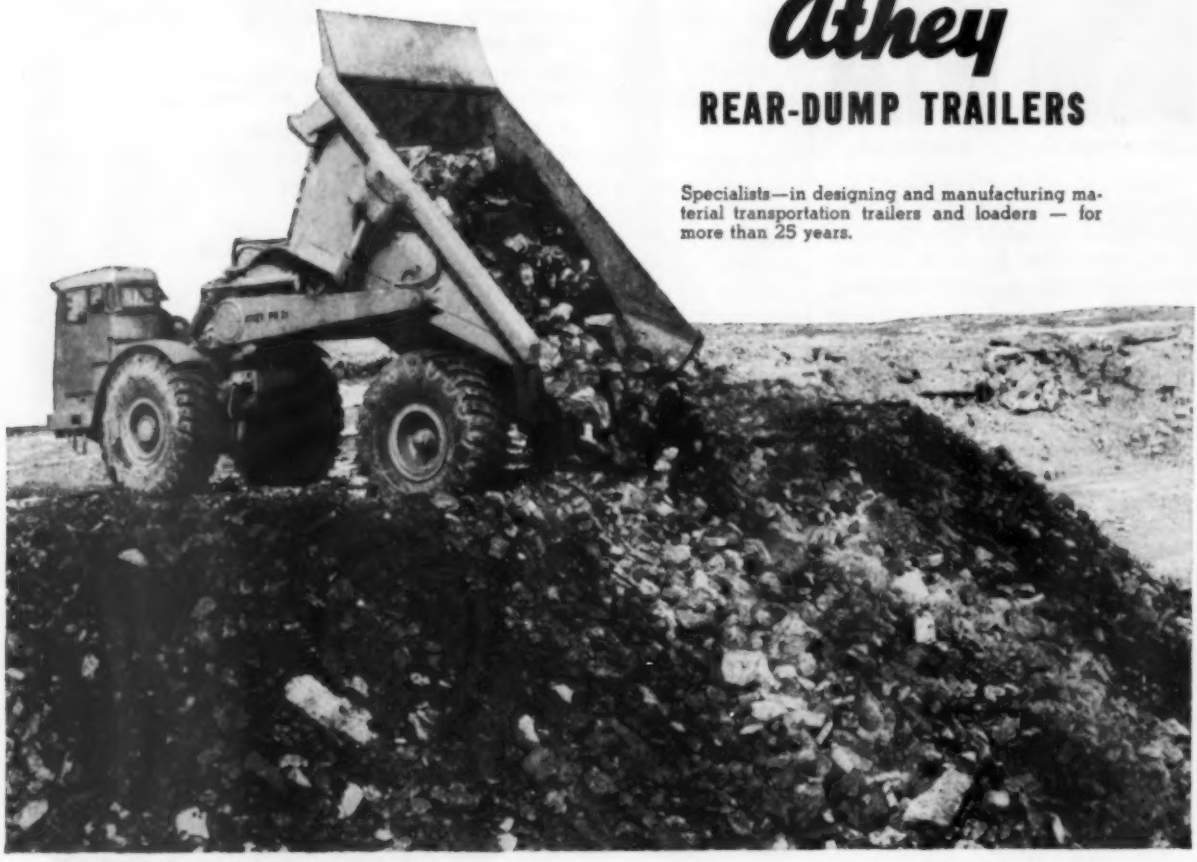


By turning 90° to back to the edge of the fill, the Athey PR21 saves 30 feet of travel, 30 seconds of time. Write to Athey for the new catalog that shows how the PR21 saves you money—loading, hauling, dumping. *It's free!*

Athey

REAR-DUMP TRAILERS

Specialists—in designing and manufacturing material transportation trailers and loaders — for more than 25 years.



Atkinson-Ostrander Construction Co. achieve best results with TIMKEN® carbide insert rock bits and TIMKEN Rock Bit Engineering Service

LOCATION: *The Dalles Dam, 95 miles up the Columbia River from Portland, Oregon.*
OPERATING CONDITIONS: *Lava basalt formation which varied from medium hard to extreme hardness.*

ON their first project at the Dalles Dam in Oregon, Atkinson-Ostrander Construction Company used Timken Rock Bit Engineering Service to determine the best bit for drilling a lava basalt formation varying from medium to extreme hardness. A Timken® carbide insert bit was selected which gave better results than any others tested.

Timken carbide insert bits give highest speed through hard and abrasive ground. They're most economical for constant-gage holes, small diameter holes, extremely deep holes.

However, they are *not* the best solution for *all* your drilling problems!

Timken multi-use bits are most economical for ordinary ground. With correct and controlled reconditioning, they'll give the lowest cost per foot of hole when full increments of steel can be drilled.

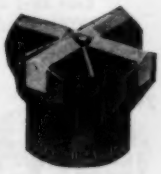
To be sure you're using the right bit type and design, call on the Timken Rock Bit Engineering Service. Twenty years of solving rock bit problems have given them the experience that will help you cut your drilling costs.

Timken carbide insert and multi-use bits are interchangeable in the same thread series. This means you can change bit types quickly, easily as the ground changes—right on the job!

Both Timken carbide insert and multi-use bits are made from electric furnace Timken fine alloy steel and have special shoulder unions which protect threads from drilling impact.

For help with your particular drilling problem, write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

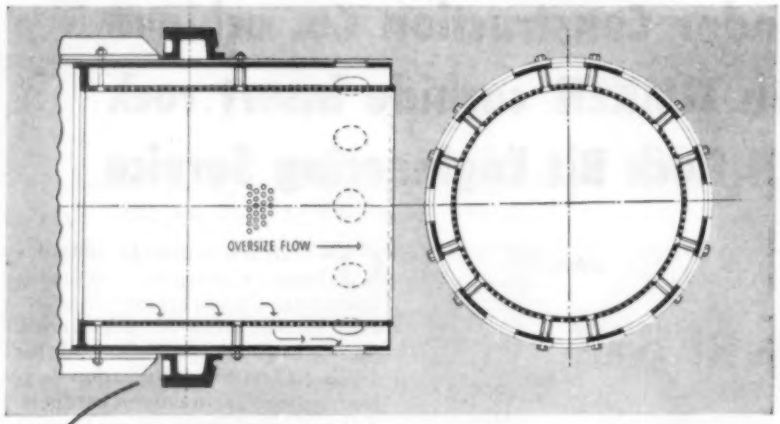


Timken threaded carbide insert rock bit

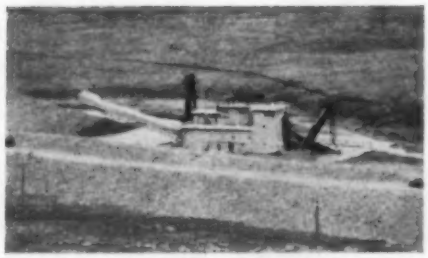
...your best bet for the best bit ...for every job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.



First Olson trommel was built for and job proved on this YUBA 8 cu. ft. dredge, Goodnews Bay Mining Co., Platinum, Alaska.



Increase Your Screening Area Without Lengthening Screen

✓ Use YUBA-built Olson Dredge Trommel on either old or new revolving screens

Now, increase screening capacity as much as 25% without lengthening your screens, with the new Olson patented dredge trommel.

Here's how: Olson dredge trommel mounts inside present revolving screens in the area usually blanked out by circular tread rings and blank end plates. Its perforated holes convert this blank space into an inner screening area that: (a) greatly increases screening capacity or (b) provides better classification of screened material through smaller perforation sizes.

Coarse material goes out the end, as in any conventional revolving screen; but fines pass through the perforated holes of the Olson trommel onto the blank shell plate; then through large holes to join fines from the forward screening area.

✓ Order from YUBA

Edward Olson developed and proved this trommel in Alaska. YUBA now has manufacturing rights under the Olson patents, and makes these trommels of ARS plate, with taper drilled holes to size and spacings you need.

Get full use from your screen; order YUBA-built Olson trommels NOW. Send detail and general arrangement of screen, hole size and spacing, for estimates. No obligation.

74

YUBA DREDGES — PROVED DEPENDABILITY

YUBA MANUFACTURING CO.

Room 718., 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG.
SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

Gardner-Denver Co., Quincy, Ill., has announced the following personnel changes:

B. P. Spann, who has been with the company for 20 years, was elected vice-president. He has been the company's director of personnel for the last eight years and previously was in charge of advertising.

J. W. Gardner, who recently was elected to serve as a member of the board of directors, has been appointed administrative assistant. He has been with the Gardner-Denver Co., since 1947, when he joined the sales force operating from the Los Angeles office.

Charles M. George, formerly sales administrator, has been appointed assistant to the president, G. V. Leece. Mr. George joined the company in 1929.

George W. Gutekunst, formerly district manager in Los Angeles, has been transferred to Quincy, Ill., to assume his new position as general sales manager. This position was formerly held by G. V. Leece, recently elected president of Gardner-Denver. Mr. Gutekunst joined the sales force of the Gardner-Denver Co., in 1937.

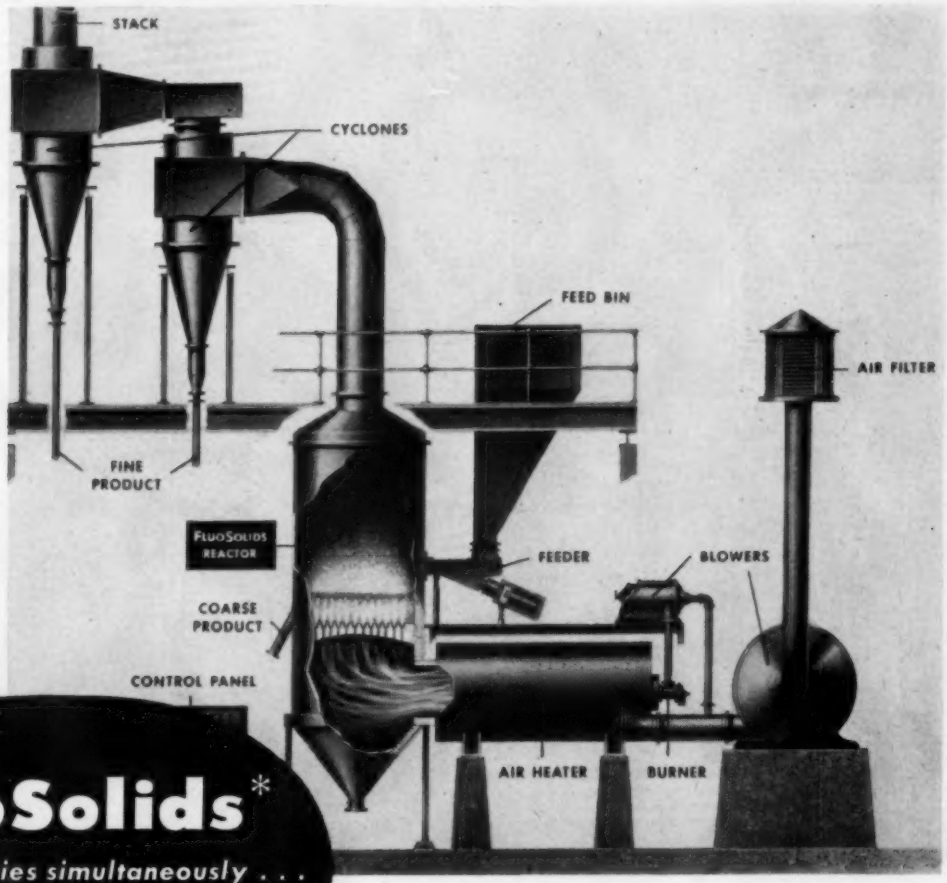
The establishment of four new sections and other changes in the Development and Research Division of The International Nickel Co., Inc., New York, N. Y., has been announced. The new sections are: Constructional Alloy Steels Section, with H. V. Beasley in charge; Electroplating Section, with Clarence H. Sample in charge; Inco Nickel Alloys Development Section, with T. E. Kihlgren in charge; and Stainless Steel and Heat-Resistant Alloys Section, with Dr. V. N. Krivobok in charge.

W. Z. Friend has been appointed to succeed F. L. LaQue in charge of the Corrosion Engineering Section; Dr. T. P. May and H. T. Paterson have been appointed technical manager and operational manager, respectively, of the *Kure Beach* Corrosion Testing Station near Wilmington, N. C.; and W. H. Sparr Jr., has been appointed to succeed Mr. Beasley in charge of the Technical Field Section in Pittsburgh, Pa.

Promotion of G. A. Hudson, former manager of the farm tire sales department to manager of truck tire sales has been announced by the Goodyear Tire and Rubber Co., Akron, Ohio, replacing H. E. Hoerster, who has resigned from the company.

Named to replace Mr. Hudson was J. C. Jolley, former assistant district manager at Kansas City, Mo.

Having trouble sizing wet, sticky material?



Typical Dorrco FluoSolids System utilizing single compartment Reactor for simultaneous drying and sizing operations.

FluoSolids*

sizes and dries simultaneously . . . makes a sharp separation in the 28 to 150 mesh range.

If you want to size wet, sticky material in the 28 to 150 mesh range — take a good look at FluoSolids. It's a radical departure from the conventional sizing and drying layout.

What can it do for you? Well, first of all, it will handle your sizing and drying jobs simultaneously. This means a single, compact installation — elimination of materials transfer between drying and sizing equipment — and resulting first-cost economy.

Operating advantages? FluoSolids gives you plenty. You can make a far sharper separation (roughly 95% complete) at both the fine and coarse ends than with conventional units. Complete yet simple, automatic instrumentation gives you precise temperature control — cuts manpower needs — saves heat — and enables the System to take feed variations in stride. There are no moving parts in the Reactor itself, either — an important factor in low maintenance costs.

If these facts sound interesting, and your needs are from one ton per hour up, we'd like to send you more detailed information. No obligation, of course.

The Dorr Company, Stamford, Conn.

*Reg. U. S. Pat. Off.

DORRCO

Better tools TODAY to meet tomorrow's demand

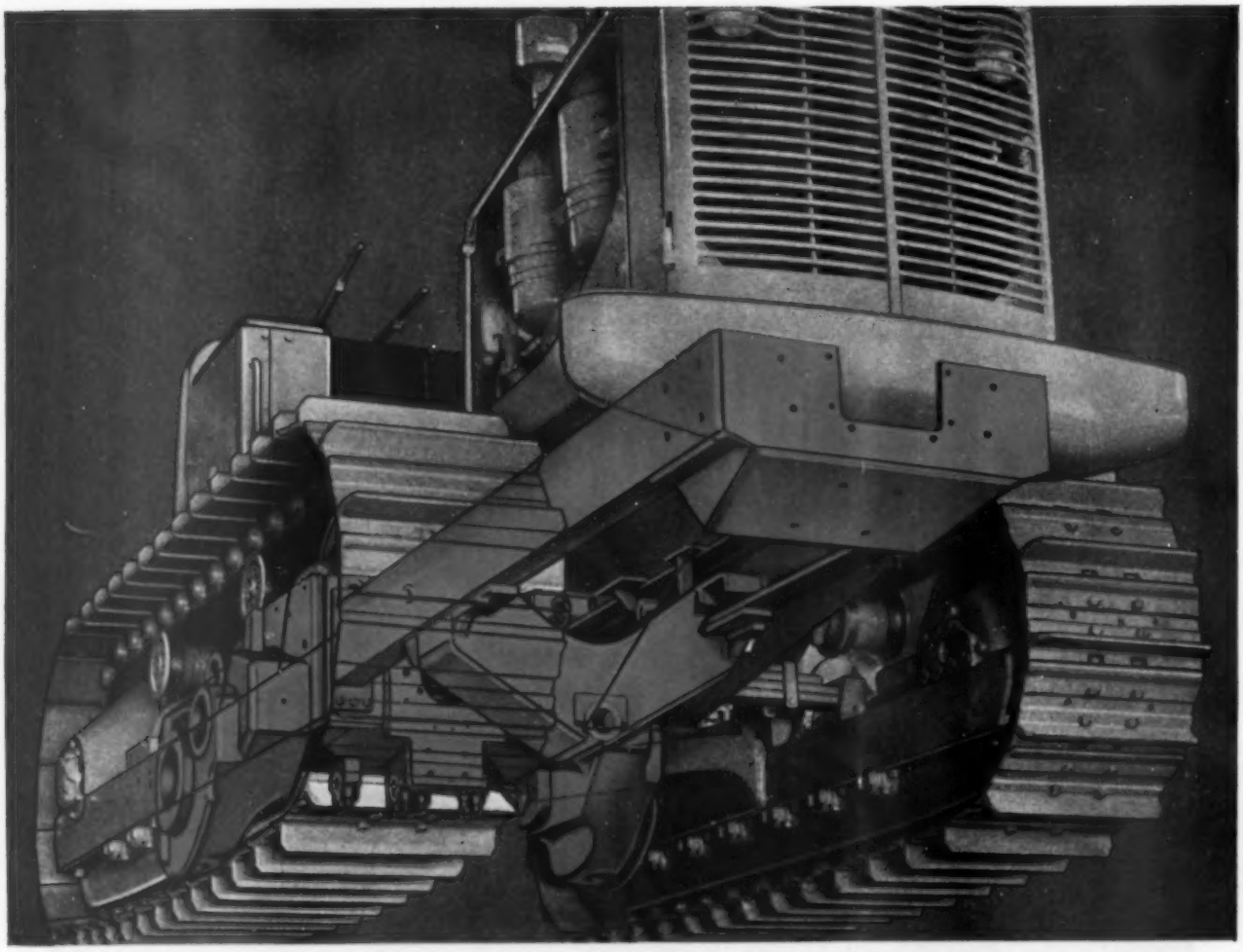
DORR

FIFTY YEARS 1904-1954

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

THE DORR COMPANY • ENGINEERS • STAMFORD, CONN.

Offices, Associated Companies or Representatives in principal cities of the world.



HOW THE MAIN FRAME CONTRIBUTES TO TOP TRACTOR PERFORMANCE

All-Steel Box A-Frame is a Key to Outstanding, Low-Cost Record of Allis-Chalmers Tractors

Mine operators everywhere are putting new emphasis on shrewd equipment buying. And rightly so. To increase production, stay on schedule and make a profit in the face of today's high costs, they have to be *sure* of getting top value in design, performance and service features.

More and more of these mine operators are now using Allis-Chalmers tractors. One of the big reasons is hidden in the heart of the tractor. It's the exclusive design which characterizes the main frames of all four Allis-Chalmers tractors. These frames are one-piece, all-steel, welded structual members (like the girders in a bridge or the columns in a building). They help provide greater strength and flexibility to withstand shock loads, better equipment mounting, improved weight distribution and outstanding service simplicity.

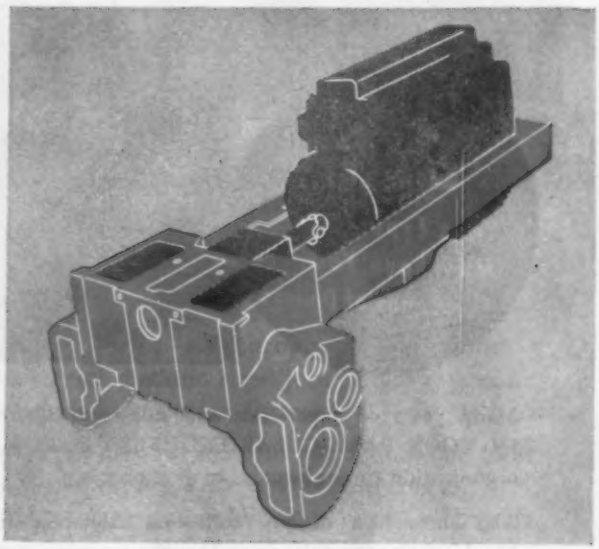
We invite you to see these advantages . . . first at your nearby Allis-Chalmers dealer, and then in a demonstration. Whichever size you may be interested in, you'll see a tractor that is not just modified . . . but designed new-from-the-ground-up to meet the needs of today's jobs.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

"Rolls with the Punch" — The resiliency of the high-tensile steel main frame enables it to flex slightly under extreme shock loads . . . without transmitting the strain to engine, clutch or transmission . . . thus offering extra protection to the complete machine.

Weight Distribution Designed for Today's Jobs— Box A-Frame lets Allis-Chalmers use a modern engine . . . locate main parts for best over-all balance . . . put more weight lower in tractor where it does the most good . . . make the tractor "built to take it."

Better Equipment Mounting — Designed to best serve changing tractor application (today over 70 percent of all tractor equipment is mounted), this compact main frame allows bulldozers to be mounted in close . . . provides ample clearance for equipment like front-end shovels . . . permits wide track shoes . . . improves performance of the entire unit.



Unit Construction for Service Simplicity — Since the main frame carries the *structural* load, power drive components are designed to do only their specific jobs. They can be readily removed, repaired or replaced without disturbing adjacent parts . . . saving service time . . . actually cutting down time because assemblies can easily be serviced under shop conditions if desired.

HD-20	HD-15	HD-9	HD-5
Weight 41,000 lb Hydraulic Torque Converter Drive 175 net engine hp	Weight 28,000 lb Choice of standard transmission or hydraulic torque converter drive	Weight 18,800 lb 72 drawbar hp	Weight 11,250 lb 40 drawbar hp

International Harvester Co. and the Diamond T. Motor Car Co., both of Chicago, Ill., have announced an agreement whereby Diamond T. will assemble some special models of motor trucks for International Harvester, and Harvester will manufacture for Diamond T. certain components used in the assembly of Diamond T motor truck models.

Euclid Sales and Service, Inc., 5231 Manchester Ave., St. Louis, Mo., has been appointed distributor in eastern Missouri and west-central Illinois, by Bucyrus-Erie Co., South Milwaukee, Wis.

St. Regis Paper Co., New York, N. Y., announces the following changes in the sales personnel of its Multiwall Packaging Division:

William T. Orr has been appointed assistant manager of the eastern district. He was formerly sales supervisor for the St. Louis and Kansas City territories.

Michael T. Biondo has assumed sales responsibility for the majority of the eastern district multiwall bag accounts formerly handled by Dean G. Abercrombie, who has been placed in charge of the Buffalo office.

Clifford E. Freeman succeeds Mr. Orr as manager of the St. Louis office. He is assisted by W. Malcolm Lowry and Robert F. Callahan, who recently joined St. Regis.

Jack Larigan, who was formerly sales supervisor of the Minneapolis territory, has been transferred to the Birmingham, Ala., office as district manager of the southwestern district.

William A. Foran, has been placed in charge of the Minneapolis office, succeeding Mr. Larigan. Jack Morris has joined the Minneapolis office as service and sales representative.

Joy Manufacturing Co., Pittsburgh, Pa., announces the election of John Lawrence as executive vice-president. He joined the company in July, 1951, as vice-president of manufacturing and in April, 1953, was named vice-president of manufacturing and engineering. His prior experience includes seven years with SKF Industries Inc., where he served as vice-president, and ten years with Jones and Lamson Machine Co., where he was factory manager.

John Lawrence

Hugh W. Sloan

Hugh W. Sloan, vice-president of St. Regis Paper Co. (Canada) Ltd., has been appointed to direct the company's operations. In this responsibility Mr. Sloan succeeds Thomas H. Cosford, who was managing director of the Canadian company until his retirement. Mr. Cosford continues as a director of St. Regis Paper Co., of which the Canadian company is a subsidiary.

Mr. Sloan, who had been assisting Mr. Cosford since last year, had formerly served as assistant to Arch Carswell, St. Regis vice-president in charge of sales. Prior to coming to the New York office in 1951, he had been Pacific Coast manager for the Multiwall Bag Division.

Fletcher L. Munger, former Western sales manager for Gilman Paper Co., Chicago, Ill., becomes assistant to the vice-president in charge of sales, with headquarters at 630 Fifth Ave., New York, N. Y. He will continue to supervise the activities of the Chicago office until a replacement is announced.

PIONEERS and LEADERS IN DUST CONTROL

Continuous Sly Dust Filter on a Feldspar Plant in Maine

Sly Dust Filter in a Rock Crushing Plant in Connecticut

SLY
Long Experience May Save You Thousands of Dollars

Many years of experience and numerous operating installations IN YOUR PARTICULAR INDUSTRY make Sly the outstanding organization to engineer your dust problem.

The know-how of dust collection cannot be found in print. It has been acquired by Sly through experience with thousands of installations for generations.

A note from you will bring you our text book bulletin or, if you wish, a Sly engineer to help lay out and specify suitable equipment.

Sly units are not expensive; they save thousands of dollars yearly in plant maintenance and improved production.

THE W. W. SLY MANUFACTURING CO.
4745 TRAIN AVENUE CLEVELAND 2, OHIO

NEW YORK • CHICAGO • PHILADELPHIA • SYRACUSE • DETROIT • BUFFALO
CINCINNATI • ST. LOUIS • MINNEAPOLIS • BIRMINGHAM • LOS ANGELES • TORONTO

100 TONS PER HOUR WITH 60% to 75% CRUSHING

with this Cedarapids Built by IOWA

JUNIOR TANDEM

Here's why CEDARAPIDS AGGREGATE PLANTS give you bigger production at lower cost

- **The faster, more efficient action of Cedarapids Vibrating Screens, plus the *horizontal* design which utilizes the full openings of the screen cloth, outscreens other types by passing 20 to 30% more accurately graded aggregate through each square foot of screen.**
- **Production of crushers, screen and conveyors is carefully balanced to eliminate bottlenecks, reduce the circulating load, and assure maximum output with low power consumption.**
- **Low-cost operation results from the low maintenance requirements. Expert design, highest quality construction and heat treated, stress-relieved components all contribute to the rugged dependability and trouble-free life of Cedarapids crushing and screening equipment.**

Producing aggregate at a hundred ton per hour clip for graveling access roads is a profitable operation . . . especially under tough 60% to 75% crushing conditions.

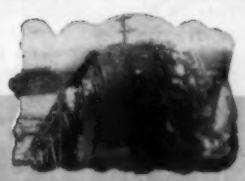
But that's typical average production for Cedarapids Junior Tandem Plants. That's one of the reasons why these plants are so widely used throughout the country for a wide variety of medium sized jobs where low costs are as important as high output figures.

Whether *your* job calls for 100 tons per hour . . . or 1000 tons per hour . . . there's a Cedarapids Aggregate Plant designed to make money for you. Your Cedarapids distributor can give you the facts. See him today.

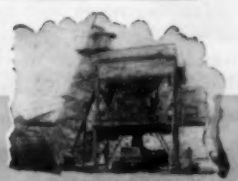
IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Master Bituminous Mixing Plant

Vibratory Soil Compactor



Motorized Head Pulley



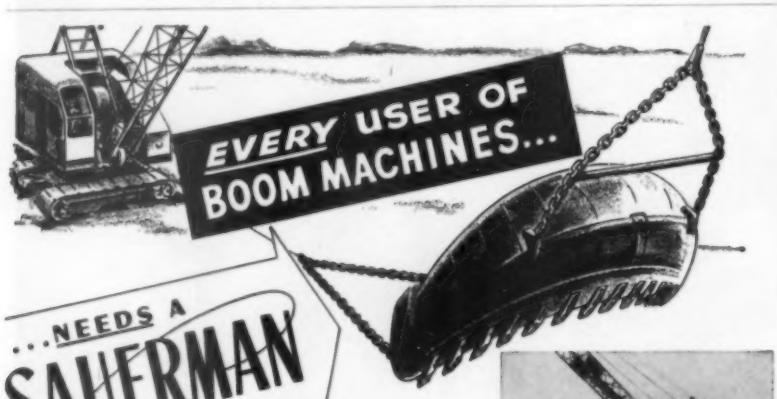
Model G-60—6000-lb. Bituminous Mixing Plant

Raymond Bag Co., Middletown, Ohio, announces the following appointments to its sales staff: James M. Green, with headquarters in Louisville, Ky., will be responsible for sales in southern Indiana and Kentucky; A. P. Wolff, with headquarters in Detroit, Mich., will service customers in northern Indiana and Michigan.

E. B. Severs has been appointed development engineer in the erection department of The Babcock & Wilcox Company's Boiler Division He will be located at the department's headquarters in Barberton, Ohio.

Eureka Boiler Works, Eureka, Calif., has been appointed to sell and service the fork-lift trucks, straddle-carriers and other materials handling equipment manufactured by the Industrial Truck Division of Clark Equipment Co., Battle Creek, Mich.

Flow Engineering Sales Co., 405 Woodland Drive, Birmingham, Ala., has been appointed as authorized distributor by The Parker Appliance Co., Cleveland, Ohio. Working with this new distributor, and providing technical assistance will be Lewis C. Ely, Parker district manager in the Southeastern area.



Above 2½-cu. yd. Crescent scraper is used on a 1-cu. yd. boom dragline and the yardage rises to 270 cu. yd. per hour. The scraper is taking gravel from a roadside pit and delivering to a movable truck loader.

Dragline capacity is increased up to 50% or more on many jobs when a Crescent Scraper is used. Cast like the regular bucket, it digs into and gathers the load with the ease of a plowshare, hauls at ground level and dumps automatically when lifted. The dragline never lifts the loaded bucket, hence it is capable of handling a scraper of larger capacity than the regular bucket or clamshell.

To dig from a river, deep pit or soft area beyond the reach of the boom, the Crescent is hung from a trolley that rides on a track cable. The cable extends from the boom tip to an anchorage. Digging, hauling and discharge proceed as in the casting operation. Following discharge, the scraper is lifted and gravity-returned to the excavation point by merely tightening the track cable.

Sauerman engineers will quote you on the largest size Crescent Scraper your dragline can handle. Just give us the make, model number and boom length.

In this picture a Crescent scraper hangs from a trolley that rides on a slack cable extending from the tip of the boom to an anchorage across the river. Thus, it is able to excavate far beyond the reach of the boom and haul material onto the bank.

Write for Field Report 219, Scrapers with Boom Machines and Catalog J, Scraper Buckets

SAUERMAN BROS., Inc.

534 S. Clinton St. Chicago 7, Ill.

G. D. Partridge, truck district manager at Cincinnati, Ohio, has been transferred to the Detroit district as manager by International Harvester Co., Chicago, Ill. E. D. Maher, formerly assistant district manager, Cincinnati, succeeds Mr. Partridge as manager.

E. W. Dodson, formerly branch manager, Charlotte, N.C., has been promoted to assistant manager at Cincinnati. R. W. Stiegler, formerly assistant district manager at New Orleans, has been transferred to Dallas in the same capacity. R. V. Ruth, formerly branch manager at Cincinnati, has been named assistant manager at New Orleans.

Dr. Wayne E. Kuhn has been named general manager of the newly-created research and technical department of The Texas Co., New York, N. Y.

Several promotions in district office personnel have been made by The Jeffrey Manufacturing Co., Columbus, Ohio.

Walter J. Hulsey, a sales engineer with the Birmingham district office, has been named district manager, Conveyor Division. Joining him as sales engineer is J. Thomas Berg from the home office.

Howard S. Davies, former Conveyor Division district manager in Chicago, has been moved to a similar post in Pittsburgh. Replacing him in Chicago is James B. Green, for a number of years assistant to the chief engineer at the home office.

Being transferred from Pittsburgh are E. E. Balduff and Travers W. Nelson, both sales engineers. The former has gone to Orlando, Fla., to work in the Jacksonville territory. The latter has become manager in Jacksonville.

William A. Cheney has been transferred from the merchandise sales department in Columbus to the post of sales engineer in New York. Vernon L. Ekblad, former sales engineer in the General Engineering Sales Division at Columbus, has taken a similar position in Houston. Robert F. Farrell has become a sales engineer in Columbus, replacing Robert D. Henning, who has moved to a similar post in the home office Products Engineering Sales Division. Robert M. Dunn has become associated with the Knoxville district office in a sales engineer capacity. George S. Kepley has been transferred from coal preparation engineering sales in the home office to Pittsburgh, as has been Edward G. Braun, former sales engineer in Buffalo.

what does

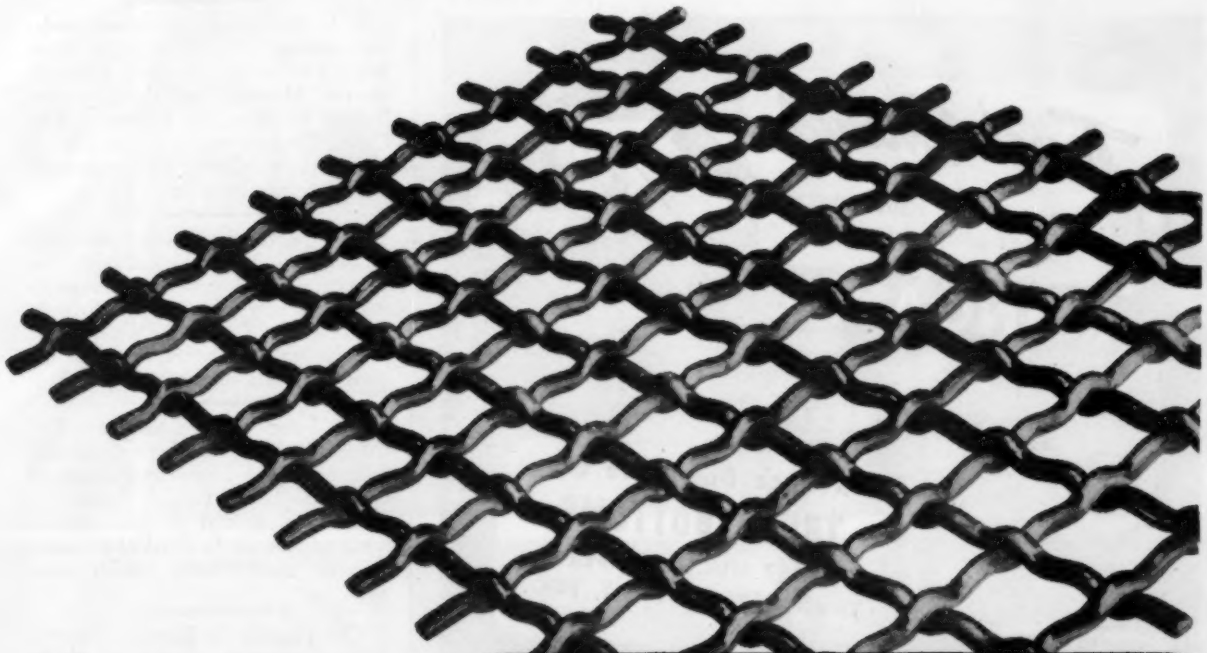
PRECISION

mean to you?

To us it means space screens that are built as tools of production.

- **Made from wire that is crimped to precision standards.**
- **Then woven extra tightly to maintain accurate, uniform spacing under the severest conditions.**
- **Results in *precision* openings that will maintain their accuracy under the severest vibration.**

Let us show you how Super-Tempered Precision Space Screens mean greater tonnage output per screen dollar.

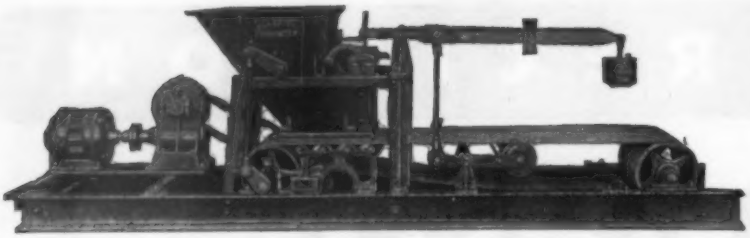


SUPER-TEMPERED
PRECISION SPACE SCREENS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION,
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo
Chicago • Detroit • New Orleans • New York • Philadelphia

2468

When in doubt...



install **SCHAFFER Poidometers**

for *Reliable* Weight Data

OVER 1300 now serving Industry

•

Write for CATALOG No. 5

GUESSING DOESN'T PAY when you're handling bulk materials.

By providing accurate weight checks at predetermined points, Poidometers are a sure bet to increase both production and profit records.

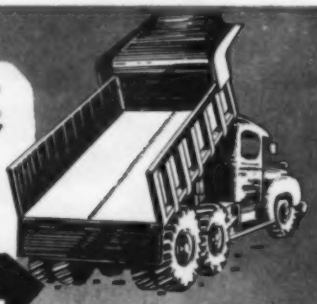
These fast, automatic units are super-efficient performers for weighing, blending, mixing, feeding, recording, and proportioning. They're unmatched for easy installation and operation, sustained work-capacity, and overall economy.

Available with remote control weighing and recording devices, and total weight recorders.

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pennsylvania

Tough Enough

. . . TO STAND UP UNDER SEVERE IMPACT AND ABRASION!



MANGANAL

U. S. Patents 1,876,738 - 1,947,167 - 2,021,945

11%-13½% MANGANESE-NICKEL STEEL

HOT ROLLED PLATES

Reduce Downtime on

TRUCK BOTTOMS

LAST MUCH LONGER THAN NEW BOTTOMS, TOO!

"HOW TO DO IT" DETAILS SENT ON REQUEST

Mill Depot Stocks: Newark • Wilkes Barre (Forty-Fort) Indianapolis • Chicago • Minneapolis

STULZ-SICKLES CO.

SOLE PRODUCERS 92 N. J. RAILROAD AVE. NEWARK, N. J.

NEAREST DISTRIBUTOR UPON REQUEST

The Dart Truck Company of Kansas City, Mo., builders of heavy-duty off-highway trucks, announces the appointment of Jack J. Burke as Eastern district sales representative. He was formerly with the Gardner-Denver Co., covering the New York area.

Gardner-Denver Co., Quincy, Ill., has moved into its new unit fabrication and warehouse building in Dallas, Tex. Built to the company's own specifications, the plant will serve Gardner-Denver's activities in the oil industry.

Joseph Cleary has been appointed plant engineer, Quaker Rubber Corp. Division of H. K. Porter Co., Inc., Philadelphia, Pa. He will be responsible for the specifications and design of all new equipment and maintenance and the repair of present plant facilities.

Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J., has announced two appointments.

Frank A. McBrearity has been named Philadelphia branch manager of the Industrial Rubber Products Division, succeeding G. R. Van Duser. Howard W. Smith succeeds Mr. McBrearity as sales representative for the central New York area.

J. A. MacIntire Jr., former assistant manager of Wire Braid Hose Sales, has been appointed Chicago District Manager for the Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown 1, Ohio. He replaces M. W. Clark, who is retiring after 40 years service.

L. Jack Clarke, former manager of the New York sales district, has been appointed general sales manager, Leschen Wire Rope Division, H. K. Porter Co., New York, N. Y. He will make his headquarters at the division's main offices in St. Louis.

The Long-Talbot Equipment Co., Columbia, S. C., has been appointed a dealer by the Highway Equipment Co., Inc., Cedar Rapids, Iowa.

Also announced is the appointment of George E. Ford of Decatur, Ga., as Southeastern district manager.

The Bagpak Division of International Paper Co., New York, N. Y., is opening a new sales office in Des Moines, Iowa, which will be responsible for the sale of the company's multiwall paper bags throughout parts of Iowa, South Dakota and Missouri. Dale Rowe will head the new office.

OCTOBER 1954

THE CONCRETE MANUFACTURER

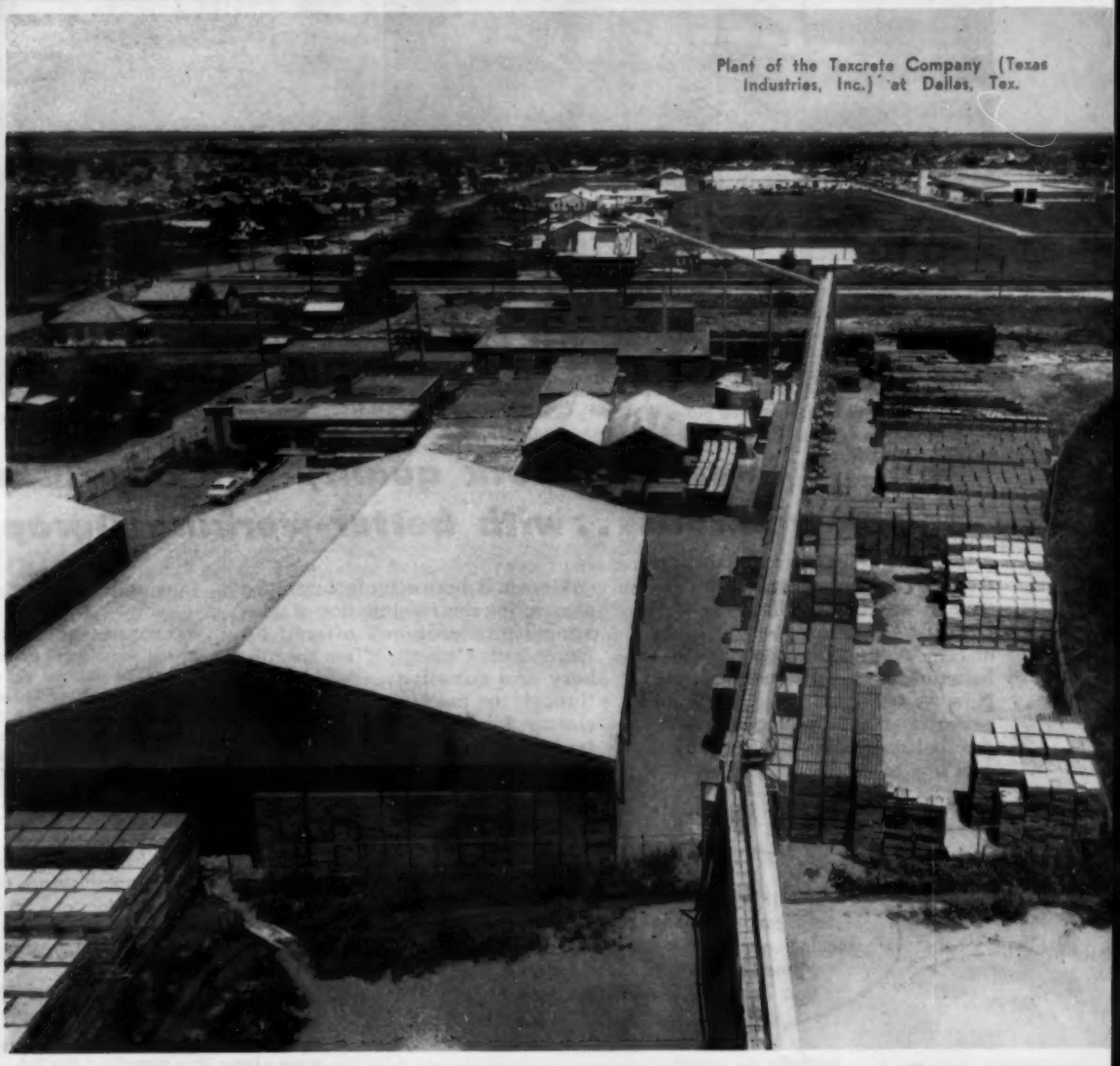
A SPECIAL SECTION OF PIT AND QUARRY

Edited for Producers of

Concrete Building Units

Pipe

Ready-Mix Concrete



Plant of the Texcrete Company (Texas Industries, Inc.) at Dallas, Tex.

Workman removes pallet of 4 units from the machine at plant owned by Herman Coppens, Mishawaka, Ind.

"We get improved block quality and appearance ...fewer culls...with better-working Duraplastic"*

Owner Coppens goes on to say: "When we started producing Brikcrete in 1948, we tried several brands of cement, but Duraplastic worked better in our machine than any other. Now we use Duraplastic 100% and get exterior and fireplace units that are better-looking — and actually cost less to produce."

More and more manufacturers are discovering this combination of sales appeal and economy offered by Duraplastic Cement. Mixes are rubbery and cohesive... feed easily through the machine... to produce cleanly formed block highly resistant to the passage of water. Reports also show that Duraplastic reduces the number of culls and throwbacks.

YET DURAPLASTIC COSTS NO MORE... Sells at the same price as regular cement. Requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Ave., New York 17, N. Y.

"THRIFTY" SAYS: You can increase profits... cut production costs with Duraplastic. Manufacturers find they have less breakage of green products... fewer costly culls and throwbacks.

"NIFTY" SAYS: Sales and good appearance go together. With Duraplastic-made products, you'll cash in on clean, true edges and corners... richer face texture, especially when harsh aggregates are used.

OFFICES: Albany • Birmingham • Boston • Chicago
Dayton • Kansas City • Minneapolis • New York
Philadelphia • Pittsburgh • St. Louis • Waco

*"Duraplastic" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

CM D-160

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

Makes Superior Concrete Products at No Extra Cost

UNITED STATES STEEL HOUR — Televised alternate weeks — See your newspaper for time and station.

The CONCRETE MANUFACTURER

October 1954

Safety Is Your Business

IT is generally believed that small industrial concerns are more dangerous to work for than the larger companies. This belief can be substantiated by figures issued by the National Safety Council which year after year show that the accident rates per capita for small companies are from two to five times higher than those for large companies. What is not stated, however, is the fact that most of the larger companies have organized safety programs, while most of the smaller companies have none. We believe that if similar safety measures were taken in both, there would be little difference in accident frequency rates, and accident severity rates would probably be lower in the small plants. The problem, of course, is how to make small operators safety conscious.

That small business can be safe business is being proved year after year by ready-mixed concrete producers who are members of the National Ready Mixed Concrete Association and who participate in its safety contest. The ready-mixed concrete industry is by its nature probably more hazardous than any of the other concrete manufacturing industries, and its safety record was not too good when N.R.M.C.A. initiated its safety program in 1946. As interest and participation in this contest gradually grew, however, results improved rapidly and its record has become one to be proud of.

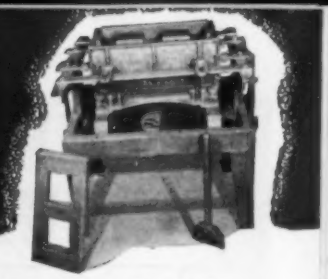
Typical are the results of the contest for the year ending June 30, 1954. For the first time in the history of this contest a company in Class A (producing more than 100,000 cu. yd. of concrete during the contest period) went through this period with an accident-free record. Actually, two companies achieved this remarkable record. Six companies in Class B (50,000 to 100,000 cu. yd.) had accident-free records. One of these has now had a perfect record in four different years, another in three, and two of them in two years. In the Class C competition (50,000 cu. yd. or less) no less than 49 companies had accident-free records. Of these 3 have now had perfect records in 5 of the 9 years the contest has been held; 4 have had them for 4 years, 7 for 3 years, and 13 for 2 years. The significance of these records becomes more apparent when it is known that not only lost-time injuries but also public liability and property damage accidents are included.

One way for a producer to improve his company's safety record would be to join his industry association and enter its contest if it has one, or to become a member of the National Safety Council. The biggest step toward safety, however, would be made if every producer realized that it is his moral obligation to provide safe working conditions for his employees, and that safety will also save him money.

In past years many producers have taken the attitude that taking safety measures is a matter of personal choice. It is becoming more and more obvious that unless producers, their industries, or their associations make much more intensive efforts to promote safety than they are now doing, the entire matter will be taken out of their hands. Employees are becoming more and more choosy about the places in which they work; they want them to be reasonably clean, comfortable, and safe; and labor unions, the government, and public sentiment are with them. If industry in general does not make working in its plants safer, labor unions or the government will step in and make them do it. We strongly urge *every* producer, large or small, to analyze his own operations and then take all necessary steps to reduce accident hazards.

Walter E. Trauffer

Another BESSER Booster ★



Hand operated block machine, using cored pallets, designed and built by Besser in 1904.

★ This is the 112th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapacs.

Ed Olsen, President of Badger Concrete Co., discussing block production with his son, Frank. Standing, is Joe Mueller, Secretary.

Haydite Vibrapac Block were used in the construction of Olsen residence. Note accentuated horizontal joints.

Two Progressive Firms Associated with Concrete Block Industry Since 1904

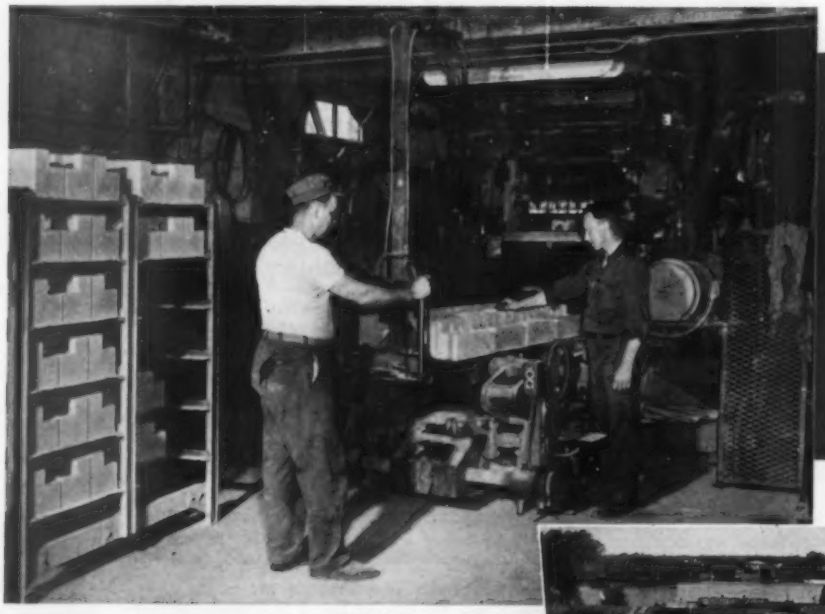
Badger Concrete Company, Oshkosh, Wisconsin, began to manufacture concrete block in 1904. That was the year Besser introduced the first hand-operated block machine. So 1954 marks the 50th Anniversary of both companies.

Ed Olsen, President of Badger Concrete Company, is very enthusiastic about the performance of his Besser Vibrapac Front Pallet Feed block machine. He carefully investigated other machines in the field and decided on Besser as best suited in his plant.

In addition to conventional block, Badger Concrete Company manufactures roof slabs, cast stone, shower trays, pipe, burial vaults and filler block for floors and roofs. All Badger products must conform to rigid quality standards. Distribution extends to a radius of 25 miles from Oshkosh.

BESSER COMPANY · Box 131 · Alpena, Mich., U.S.A.

Complete Equipment for Concrete Block Plants



VIBRAPACS ARE VERSATILE!

The flexibility of the Besser Vibrapac, and the advantage of the original Besser principle of making all sizes and types of block on ONE set of Flexible Pallets, enables the Badger Concrete Company to supply a wide variety of blocks for the entire building. Shown here is the Vibrapac producing 8" header block, regulated by shorting bolts for uniformity.

(right) Yard scene at the Badger Concrete Company plant in Oshkosh. Note stock piles of Vibrapac Block produced with Besser Vibrapacs.

BESSER 50th Anniversary 1904-1954

A Half Century of Concrete Masonry Progress!

NEWS OF THE CONCRETE INDUSTRIES

Unit Masonry Association Of Oregon to Include Allied Building Trades

THE formation of an organization to be known as the Unit Masonry Association of Oregon has been announced by Ray F. Wimer, Columbia Brick Works, Portland, first president of the group.

Included among the various classifications making up the membership of the association are concrete products plants, brick manufacturers, the Portland chapter of the Mason Contractors Association of America, the Bricklayers Union, and building supply houses specializing in masonry materials. Membership in some classifications is already 100 percent.

The Unit Masonry Association is the second organization of its kind in the United States, the first having been formed in Seattle, Wash., about a year ago. The success of the two organizations and the potential benefits to be derived by the combined efforts of masonry manufacturers and allied groups in the promotion of masonry promises to inspire other groups of its kind to form similar organizations. Salem and Eugene, Oreg., are expected to form chapters and affiliate with the Portland group soon. Kansas City, Mo., also is in the process of organizing a unit masonry association.

Officers in the association and members of the board of trustees include the following: Montie Smallen, mason contractor, vice-president; Al Thomas, business representative of the Bricklayers Union Local No. 1 of Oregon, secretary; and George Erland, manager of Pacific Building Materials Company, treasurer.

The association's program includes an annual apprentice bricklayers' contest for the championship of the state of Oregon, an architects' contest, construction of a unit masonry model home, and cooperation with annual local events featuring home building.

Coming Events

October 18-22, 1954 — Chicago. 42nd National Safety Congress and Exposition. Conrad Hilton Hotel.

October 25-27, 1954 — St. Louis. Fourth annual short course of instruction, American Concrete Pipe Association. Statler Hotel.

October 28-29, 1954—Los Angeles. Regional meeting, American Concrete Institute. Statler Hotel.

October 28-November 2, 1954. Annual meeting, North Carolina Concrete Masonry Association. Aboard the Swedish liner *Stockholm* to Bermuda.

November 22-24, 1954 — St. Petersburg. 11th annual meeting. Southeastern Concrete Masonry Association. Soreno Hotel.

January 9-13, 1955—Miami. 25th annual convention, National Ready Mixed Concrete Association. Miami Municipal Auditorium.

January 12 and 13, 1955—Milwaukee. 35th annual convention, Wisconsin Concrete Products Association. Plankinton Hotel.

January 17-19, 1955—Niagara Falls, Ont. Annual convention, National Concrete Products Association (Canadian). Sheraton-Brock Hotel.

January 24-27, 1955 — Cleveland. 35th annual convention, National Concrete Masonry Association. Cleveland Public Auditorium.

February 21-24, 1955—Milwaukee. 51st annual convention, American Concrete Institute. Hotel Schroeder.

Canadian Products Men Plan Annual Convention Jan. 17-19 at Niagara Falls

Concrete products manufacturers in Canada, whose sales to date indicate that this will be a record year, are already making plans for the next annual convention of the National Concrete Products Association.

In charge of the 1955 convention is W. H. Kirkpatrick, first vice-president. Other committee members are P. McPherson, R. Eakins, and H. Tracey, publicity committee; C. S. Hadley and R. Thomson, resolutions committee; G. Fraser, W. C. Coupland, and A. D. Wylie, nominations, election and by-laws committee; B. Coleman and A. Wylie, entertainment committee; C. Luke and M. Henderson, refreshment committee; R. Thomson, Mrs. J. Pennachetti, Mrs. R. Thomson, Mrs. G. Fraser and P. McPherson, ladies and reception committee; W. C. Coupland and A. Wylie, registration committee.

Los Angeles to Be Host City To Regional Meeting of A.C.I.

The American Concrete Institute's seventh regional meeting will be held October 28 and 29, at the Statler Hotel in Los Angeles, Calif. The two-day meeting will place major emphasis on West Coast concrete construction practices and techniques.

On the tentative agenda are sessions on properties and production of concrete, new techniques in concrete design and construction, earthquake and blast design of reinforced concrete structures, and a technical forum.

● Members of the Oregon Unit Masonry Association's public relations and advertising committee study new promotional plans. Shown in the picture: Ray F. Wimer (president), Paul L. Nutt, Al Thomas, Ron Burk, Joe Bennett, Glenn Tidyman, Lyle Parsley, George Griffis, and Herb Priest.

R/ Ready Mix

By Harry F. Thomson

Truck Holding Time — A Perpetual Headache

HOLDING ready-mix trucks at the job beyond a reasonable time for unloading is a problem for every producer. Such delays may be expected to occur at times on all jobs, whether large or small. Handling this problem presents various questions as to policy—what is "reasonable" time for discharging loads of various sizes; what is a fair charge for excess time; how to maintain good customer relations without appearing supine in granting demands for cancellation of charges. Also indirectly involved is the matter of what competitors would do under similar circumstances. Although there can be no satisfactory answer to each of these questions, a consideration of the "whys and wherefors" presents some matters of interest.

Basically, the problem is similar to that of demurrage on railroad freight cars. After long experience, the railroads have adopted rules for holding a car longer than the "free time" after placement, which is currently two days; for detention beyond four days the demurrage rate increases sharply. But the delivering railroad will enter an "average agreement" with regular consignees, whereby cars released in time for switching before expiration of the free time are credited against demurrage days at the starting rate, but not against days at a premium rate. Charges are billed monthly as based on a summary of debit and credit days, but unused credits cannot be applied on a succeeding month. Nor are any credits allowed for days in transit beyond normal scheule time; it is presumed that the movement has been handled as promptly as conditions permitted. These rules are intended to encourage prompt loading and unloading of cars; they apply to large shippers as well as small.

The problem of ready-mix producers in connection with time of holding trucks on jobs would be greatly simplified if standard rules and charges, somewhat along the line of those for car demurrage, could be applied generally or at least in each competitive area. The fact that such standard treatment cannot be applied may be a part of the price we pay for free enterprise, as compared to federal regulation as applied to railroads.

One of the variants from the policy held by the railroads is the attitude of many ready-mix customers in demanding a flexible rate of service, *i.e.*, the volume of deliveries must vary from hour to hour in accordance with the rate of placing concrete at the job. Such a demand forces one of two conditions on the producer; either he (1) over-serves the job with more trucks than the average consumption justifies, in which case there may be considerable idle time in waiting to unload, or (2) if he assigns only the trucks to deliver the average rate of consumption, there will be gaps at the job waiting for concrete when the rate of use speeds up.

Then if on another day the concrete trucks arrive as ordered but are held at the job for unloading due to some slowdown in placing or possibly a breakdown of hoisting equipment, the superintendent may argue against paying for such excess holding, claiming that the value of the truck time is only $6 per hour, whereas the cost of the placing crew who were idled on a certain day may have been $1.00 per hour. Such a controversy can easily become destructive to customer relations.

There is no uniformity among producers in the allowance of free time for unloading; 15 minutes is a common allowance, regardless of size of load or of trucks; but some producers allow a free time of 20 minutes and some even 30 minutes per truck. Others have based the free time on the size of load, such as 3 or 4 minutes per cu yd. This may be reasonable for loads of moderate size, 3 or 4 cu. yd., but it results in an unduly high time if applied to the 8- and 10-cu. yd. loads being furnished in several of the larger cities, since the economic justification of such large units is a reduction in minutes per cu. yd. for delivery. Moreover, the rate charged for the truck (with driver) has varied widely. A rate of 10c per minute, or $6 per hour for units having a capacity of 4 or 5 cu. yd. has been common; but as units with capacities twice as large are more valuable and commonly carry a higher driver's rate, a charge of 12 to 15 cents per minute may not be unreasonable.

But before a producer can consider a policy of charging for excess holding time, he must establish a system for obtaining the time of arrival at the job and release, for each load. The dray ticket can have spaces for noting the following: "Left plant", "Arrived job", "Released job", "Returned plant". The plant times can be entered by the dispatcher, either by time stamp or by hand.

Many companies have the dispatcher post these truck times on a "dispatching sheet" (similar to that illustrated) as the dray tickets are turned in after each load. This particular sheet has been used by a large company which operates several plants in a metropolitan area. Several of the columns could be omitted from the sheet for a single plant where the employees are bet-

This 17¼- by 10⅞-in. form is a dispatching sheet used by a large concern which operates a number of plants in a metropolitan district.

SHEET_____ OF_____ DELIVERIES OF READY MIXED CONCRETE YARD_____ DATE_____ WEATHER_____

CUSTOMER	JOB ADDRESS	TICKET NO.	LOAD NO.	CU. YD. OF ADD. WATER	TOTAL CU. YD. DISPATCHED	QUALITY OF CONCRETE	EXTRA LOADING, ETC.	TRUCK DRIVER	TRUCK NO.	ARRIVED YARD	LEFT YARD	ELAPSED TIME	ARRIVED JOB	LEFT JOB	ELAPSED TIME	EXCESS TIME AT JOB	REMARKS

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Smith is the FIRST manufacturer to design and build TWO distinct types of truck mixers to meet the needs of the Industry. Regardless of what your local conditions call for . . . and the price you want to pay. . . there's a Smith-Mobile "tailor made" to fit your requirements. For further details, contact your nearby Smith Distributor.

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— the Finest Truck Mixer that Money Can Buy

PREMIUM Model
First Low-Priced Truck Mixer with SMITH Quality

SMITH
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ter acquainted with the individual jobs. This type of summary of operations is valuable in several ways: (1) it gives the dispatcher a view of the disposition of the trucks and shows the progress toward filling each order; (2) it permits the company executive to survey the timing of trucks at the plant and at each job; and (3) it furnishes a convenient basis for totalizing the quantities of materials used each day. The detail of truck-time at the plant is as important as time at the job; it is an item which can be controlled by the plant operator. For instance, a mechanical means of handing the dray ticket to the driver, instead of having him leave the truck and enter the dispatcher's office for instructions, may save 2 or 3 minutes.

The driver is usually held responsible for the correct entry of the job times on the dray ticket; but it is well to arrange for the same time to be noted on the customer's copy, both for his information, and for protection against possible complaint that the driver entered a fake time in order to cover up a possible "coffee stop" enroute. On deliveries into large industrial plants or government reservations it is frequently arranged for the gate-keeper to note the times of trucks in and out. In such cases it is desirable to have an understanding with the customer as to the significance of the gate-keeper's timing because there may be traffic delays on the premises which are not chargeable to the concrete crew, but which will involve truck-time expense for the ready-mix producer.

(To be continued.)

Oswalt's New Block Plant Is Last Word in Efficiency

The new concrete block-producing plant of the Oswalt Company in Broadview, Ill., a suburb of Chicago, geared to turn out 15,000 8-in. equivalent units daily, was officially dedicated on September 25. Some 50 interested guests, including many other producers of block in the Chicago area were conducted through the plant and shown all details of the operation, which is one of the most modern in the industry

The plant is equipped with two complete and separate sets of bins, mixers, and molding machines, each system making use of the latest devices in control of the flow of materials and products Some of the basic principles followed were described in detail in PIT AND QUARRY in November, 1952, and September, 1948 These features embraced substantial savings in the compaction of concrete masonry units Since that time Mr. Oswalt has consummated many other ideas, including the following: moisture control of three types of aggregates; a practically dustless mixing operation; efficient employment of all labor; the use of turntables facilitating racking, cubing and removal of 1080 8-in. equivalent units hourly; a curing system presently low-pressure, but having boiler capacity for future autoclaving of a part of the output, and the production of several special units and tinted patio slabs All of these operations are controlled in an efficient system.

This plant will be fully described in the next issue of PIT AND QUARRY. Mr. Oswalt plans to conduct several additional plant tours in the immediate future for contractors, architects, and others.

Ferro-Concrete (Canada), Limited, an affiliate of Ferro-Concrete, Limited, Liverpool, England, has purchased a five-acre site at Toronto, Canada, preparatory to erecting a plant scheduled for completion next spring. M. A. Main will be head of the concern, which will manufacture several kinds of precast reinforced and precast prestressed concrete products.

MEET A MONEY SAVER

Latest Model "C"

A NATIONAL CAR SHAKER, in service 4½ years at a ready-mix plant, has unloaded over 1 million tons of sand and gravel in all kinds of weather. Only one man has operated the shaker. Estimated savings — $23,000.

NATIONAL CONVEYOR & SUPPLY CO.
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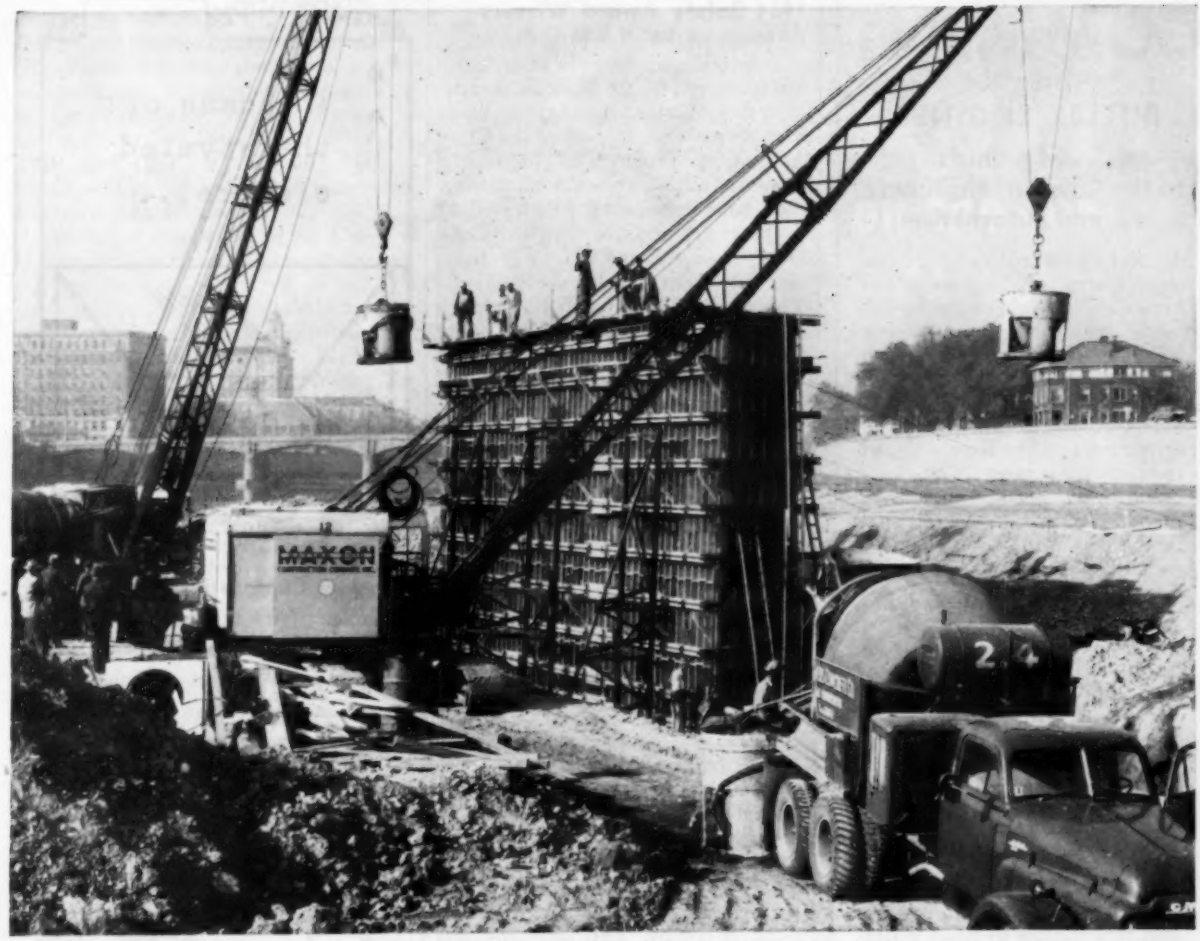


Jaeger truck mixers set profitable pace

2 payloads of stiff concrete per hour (3 miles round trip, in traffic)

The Patterson Riverside Bridge at Dayton, Ohio, built by Maxon Construction Co., required 10,000 cu. yds. of State Specification concrete of 3" maximum slump (6,000 yds. for the bridge and the balance for the approaches).

By averaging 2 payload trips per hour, 3 miles round trip, in traffic, 5 to 7 Jaeger 4½-yard "Mix Plus" truck mixers were able to deliver 300 cu. yds. in less than 6 hours in a maximum day's pour. This rate of production was made possible by good plant operation, plus the ability of Jaeger mixers to charge, mix and discharge low slump specification concrete faster than any other make of truck mixer.

On this job, the "dual mix" drums, equipped with Jaeger's sealed end loader, enabled Dayton Builders Concrete Co. to charge without blowback in less than 15 secs. per yd., to mix thoroughly in transit, and to discharge equally fast. One quick turn of a hand wheel opens the Jaeger hopper for an uninterrupted flow of mix.

"Mix Plus" truck mixers are available in capacities of 3 to 7½ yds. (4¼ to 10¼ yds. as agitators). The widest range of optional choices of equipment enables you to meet your local condition, payload requirement, weight limitation and wet-mix or dry-batch operation with standard units readily mountable on standard makes of trucks.

Ask your Jaeger distributor to show you the many plus features of the Jaeger "Mix Plus". Or send for Specification TMB-4.

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

FRONT END LOADERS • COMPRESSORS • PUMPS • CONCRETE MIXERS • PAVING MACHINES

COMMENT
from the
BUTLER ENGINEER

... of orchids to the Corps of Engineers ... and automation

A very forward-looking and alert Corps of Engineers has kept the desk lights burning for many weary nights to bring forth definite and definitive spec's covering the production of Ready Mixed Concrete. This move, greatly needed, is of vast importance to the Ready Mixed Industry for it provides absolute clarification of what kind of plant or what kind of job as a basis for bidding on civilian or military work supervised by the Corps.

Automation of Ready Mixed plants is going to be required in certain contract classifications. Your Butler Engineer promises that Butler Bin will help you meet the new specifications by revising your existing plant ... and by engineering new plants to the requirements.

At any rate, orchids and a sweeping bow to the Corps.

Speaking of plant automation, and this applies to Road Builders as well as Ready Mixed plant owners, I often wonder what your batch operator thinks when he goes home with protesting muscles, aching back and tired mind and, over the suds (soap, of course) contemplates what is provided his wife in her household work. Consider: automatic dishwasher, automatic heating, automatic toaster, automatic refrigerator defrosting, automatic cooking, automatic water heater, even automatic music to wake up. And he drives a car with automatic shift and automatic dimmers on the lights.

The moral? Plant automation pays ... in higher production ... better quality ... greater profits ... happier owners ... happier operators ... happier customers.

Yours — automatically,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

1954 Safety Award Winners Announced by N.R.M.C.A.

The results of the 1954 safety contest sponsored by the National Ready Mixed Concrete Association have been announced. Winner of the Class A contest (companies producing more than 100,000 cu. yd. during the contest period of July 1, 1953, to June 30, 1954) is Certified Concrete, Inc., East Chicago, Ind., which had an accident-free record. This is the first time in the history of the contest that a Class A winner has had an accident-free record. The runnerup, Michigan Foundation Co., Inc., Trenton, Mich., also had a perfect safety record, but following the association's policy, the company with the greatest combined total of yards of concrete produced and man-hours worked (certified) is declared the winner in the case of identical scores. Consequently the Michigan firm will receive a Certificate of Achievement in Safety.

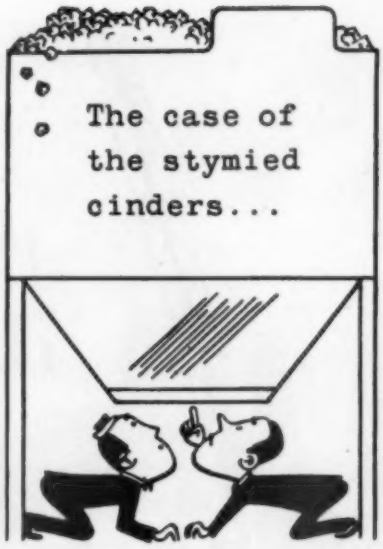
Certified Concrete Inc., as well as the winners of the Class B and Class C competition, will receive bronze trophies, which are awarded annually by PIT AND QUARRY.

Six companies in the Class B competition (companies producing from 50,000 to 100,000 cu. yd. of concrete during the contest period) had accident-free records. The Morse Sand and Gravel Co., Inc., Pawtucket, R.I., will be awarded the Class B trophy. This company was also the winner in the Class B competition in the 1952 contest and last year had an accident-free record, although another company had a greater total of man-hours worked and cubic yards produced.

In recognition of their accident-free records in Class B competition, Certificates of Achievement in Safety will be awarded to Eberts Brothers Co., Wyandotte, Mich.; Ready-Mix Concrete Co., Reno, Nev.; Stewart & Nuss, Inc., Fresno, Calif.; Acme Ready-Mix Concrete Co., Rockford, Ill.; and C. W. Shirey Co., Waterloo, Iowa. Stewart & Nuss, Inc., was the winner of the Class B Trophy last year, and thus has had an accident-

About Our Cover Picture

● The cover picture this month shows the 800-ft. belt conveyor which carries Haydite lightweight expanded shale aggregate from the Dallas Lightweight Aggregate Company's plant to the bins of the Texcrete Company, Dallas. (Both of these firms are subsidiaries of Texas Industries, Inc.) The first loading point on the conveyor is for trucks; the second is for railway cars. Texcrete masonry units and Holiday Hill stone units are being cured in the covered storage area and in the open yard.



In a Cincinnati outfit handling cinders by the hundreds of tons, production reached a deadlock. Arching and bridging stymied the cinders in their normal course through the bins.

But once again a CLEVELAND vibrator on the sloping side of the bins put an end to costly bottlenecks and equipment downtime.

Tell us about your particular stymie, or ask for our detailed literature. We're sure there's a CLEVELAND to fit your requirements.

AIR *and* ELECTRIC

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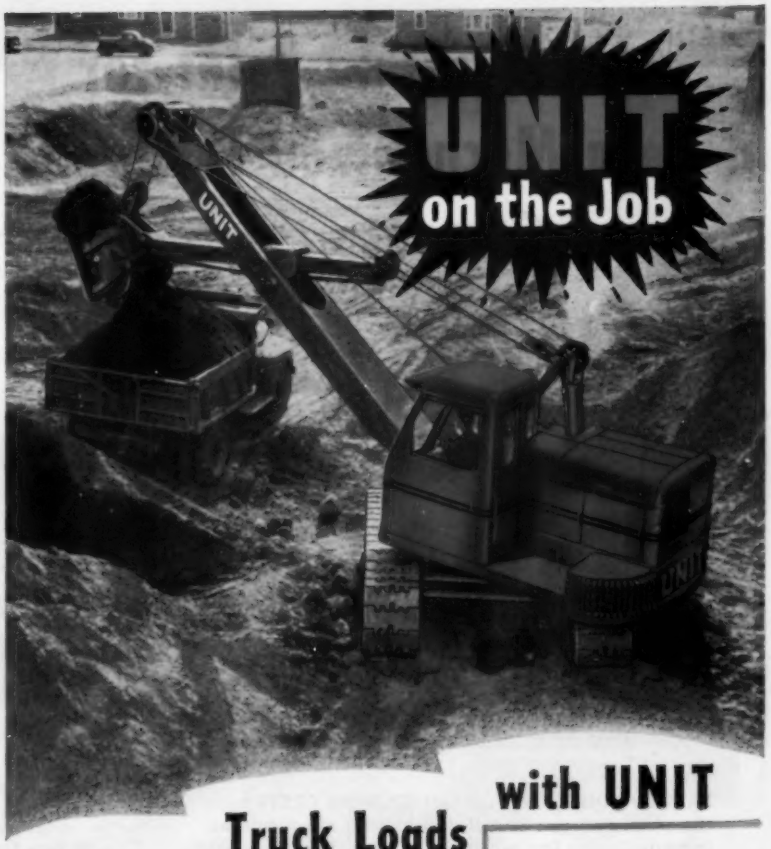
free record for two consecutive years. The Eberts firm has also had a fine safety record throughout the years of the N.R.M.C.A. contest, having an accident-free record in 1948, 1950, and 1951. Acme Ready Mix Concrete Co. achieved an accident-free record in 1951 and 1952.

Forty-nine companies in the Class C competition (companies producing less than 50,000 cu. yd. of concrete during the contest period) had accident-free records. Gerlach Builders Supply, Inc., Topeka, Kans., will be awarded the Class C trophy. (Last year this company had an accident-free record in the Class B competition). Certificates of Achievement will be awarded to the following Class C companies:

***American Aggregates Corp., Greenville, Ohio
*The Beckley & Meyers Co., Springfield, Ohio
*The Beckman Supply C., Hammond, Ind.
**Builders Supplies Co., Goldsboro, N. C.
**Cairo Redi-Mix Corp., Cairo, N. Y.
*Cement-Mix Concrete Co., Erie, Pa.
Certified Materials, Inc., Goshen, Ind.
The City Coal & Supply Co., Meadville, Pa.
*Corvallis Sand and Gravel Co., Corvallis, Oreg.
William E. Dailey, North Bennington, Vt.
Dubuque Ready-Mix Concrete Co., Dubuque, Iowa
**Findorff Lumber & Supply Co., Madison, Wis.
Fort Dodge Concrete Co., Fort Dodge, Iowa
Gethmann Concrete & Materials Co., Gladbrook, Iowa
Grand Junction Building Materials Co., Grand Junction, Colo.
***Helena Sand and Gravel Co., Helena, Mont.
*Howell's Ready-Mix Concrete Co., Parsons, Kans.
Ideal Ready-Mix Co., Inc., Ottumwa, Iowa
*Ireland and Lester Co., St. Joseph, Mich.
Kenyon Materials Co., Inc., Bremerton, Wash.
*E. C. King Contracting Ltd., Owen Sound, Ontario, Canada
Kuhns Concrete Co., Springfield, Ohio
F. D. Lewis & Son, Inc., Greensboro, N. C.
Macy Brothers, Inc., Lynnville, Iowa
**Mathews Ready Mix, Gridley, Calif.
Maxymillian, Inc., Adams, Mass.
May Coal & Building Material Co., Inc., Independence, Mo.
***Maysville Ready-Mix Concrete Co., Maysville, Ky.
***Mesabi Construction Co., Hibbing, Minn.

(*Continued on page* 184)



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CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

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Perfect Starting Point for Modern Mechanized Handling of Concrete Products...

THE WHITE 3000

SPICKELMIER CO., of Indianapolis, Ind., a great name in building materials for 48 years, now has four White 3000's with Superlite Unloaders in service. Handles 900 Haydite building blocks which can be unloaded in 20 minutes. It is a Model 302264 White with 250A Mustang Engine, 24 ft. body, power steering and many other top-quality features.

SAVE HANDLING TIME . . . CUT DELIVERY COSTS with the truck that can be tailored to your exact operating conditions for substantial time and cost savings —The White 3000.

Here is the perfect starting point for efficient materials handling of concrete products of all kinds because of its functional design, ideal weight distribution, superb maneuverability, rugged performance and power.

If you are contemplating a change in your materials handling program . . . from quarry to building site . . . see your White Representative . . . first!

Modern way to handle a load of 6,000 bricks with real time savings, from plant to off-the-road site.

WHITE 3000 tractor trailer loaded with Rapidex Haydite sectional slabs, a Spickelmier roof and floor system. Maximum payload with minimum handling and remarkable maneuverability with the White 3000!

. . . With the patented safety power-lift cab

IF YOU HAVE A MATERIALS HANDLING PROBLEM—

Or a new operation with specialized transportation needs, see your White Representative. White transportation engineers will be glad to help you achieve maximum transportation efficiency in your own operations.

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FOR MORE THAN 50 YEARS THE GREATEST NAME IN TRUCKS

Add it up for yourself...

+ Haul Biggest Payloads In Any Area
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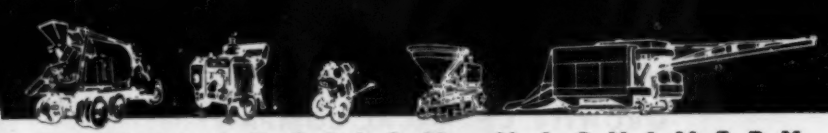
= **BIGGEST PROFITS WITH REX ADJUSTA-WATE MOTO-MIXERS®**

Just add up all these profit-making advantages you get *only* with Rex Adjusta-Wate Moto-Mixers...every day, every week, every month. The Adjusta-Wate principle alone offers the flexibility that reduces hauling, operating and delivery costs...performance that adds up to more profit for you.

Figure the Rex Adjusta-Wate for your operation. Compare it with any other. See it today at your Rex Distributor or write Chain Belt Company, 4782 W. Greenfield Ave., Milwaukee 1, Wis.



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BETTER concrete blocks at lower operating costs

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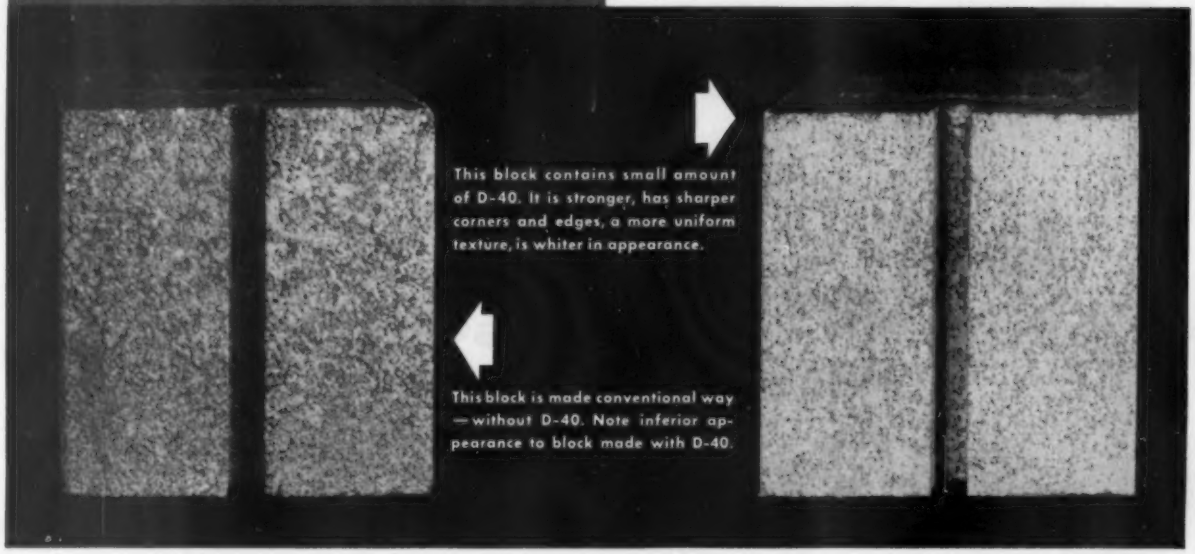
This block contains small amount of D-40. It is stronger, has sharper corners and edges, a more uniform texture, is whiter in appearance.
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Reduced abrasive wear on mixing and molding equipment
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Oronite's ready-to-use additive, D-40, is economical and easy to use. Only one to two ounces is needed per bag of cement. Just add to dry cement at the mixer.

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ORONITE CHEMICAL COMPANY

Directors of N.R.M.C.A. Discuss Industry Problems At Murray Bay Meeting

another ON THE SPOT report

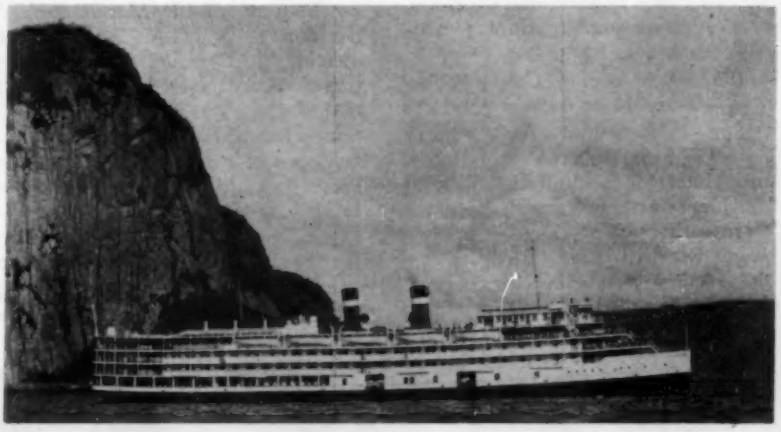
THE boards of directors of the National Ready Mixed Concrete Association and the National Sand and Gravel Association held their joint semi-annual meetings this year on August 25 and 26 at the Manoir Richelieu, Murray Bay, Quebec. From a business standpoint these were excellent meetings, with record attendance; and much important work was done. It has been the custom in recent years for these meetings to be held at outstanding resorts reasonably accessible to most of the members. The site at Manoir was unanimously voted one of the best selections yet made, combining the luxury of one of the world's finest resort hotels with breath-taking scenic beauty. Preceded by the Saguenay River boat trip, this meeting was one to be long remembered.

By WALTER E. TRAUFFER

Nearly everyone took the entire package tour arranged by the United States Travel Agency. This trip began at Montreal, where board members and their families, totaling nearly 200, boarded the Steamer *Tadoussac* of the Canada Steamship Lines, which also operates the Manoir Richelieu. Leaving Montreal at noon on Sunday, August 22, the boat sailed down the broad St. Lawrence and made an early morning stop on Monday at Quebec for a short sightseeing tour. That noon it stopped at Murray Bay, where a few additional members came on board. After a late afternoon stop at Tadoussac, a picturesque resort town at the confluence of the St. Lawrence and Saguenay rivers, the trip was continued up the Saguenay to Bagotville, where the boat was anchored overnight. The return trip down the beautiful Saguenay was made on Tuesday morning, and everyone disembarked at Murray Bay shortly after lunch. The facilities for recreation there left nothing to be desired, including a glass-inclosed heated swimming pool and one of the world's best and most scenic golf courses. Friday noon after the meetings were over the boat left Murray Bay for Montreal, arriving there Saturday noon to complete a memorable week.

The N.S.G.A. board met on Wednesday morning, August 25, and the N.R.M.C.A. board met in the afternoon. On Thursday morning a joint meeting was held, followed by a joint luncheon.

President's Address In a brief opening address President Robert C. Collins (Warner Company, Philadelphia, Pa.) mentioned the fact that the ready-mixed concrete industry has been exempted from renegotiation and expressed the appreciation of the association to Frank P. Spratlen Jr. (Ready Mixed Concrete Co., Denver, Colo.) for his work on this matter. Mr. Collins also read a letter of appreciation from the A.S.T.M. to Stanton Walker, director of engineering, N.R.M.C.A., for his many years of active work as a member and director of that body. He also commented on the fact that all but four of the members of the N.R.M.C.A. board were present at this meeting.



Above: The steamer Tadoussac which carried directors and their families on a 3-day cruise on the St. Lawrence and Saguenay Rivers.

Left: In this congenial group are: Mr. and Mrs. John B. Donovan (Valentine Concrete Co., Inc., Springfield, Mass.); Mr. and Mrs. William Moore (J. P. O'Connell Co., Boston, Mass.); and at right: Mr. and Mrs. Stanton Walker (N.R.M.C.A.).

Future Meetings At the joint meeting of the two boards plans for future meetings were discussed. Louis C. Schilling (I. E. Schilling Co., Miami, Fla.), chairman of the committee on arrangements for the 1955 joint convention in Miami, January 9 to 13, said that plans are well in hand and that there will be ample accommodations for all members and others who wish to attend. Provision has been made for pleasure as well as for business. Registration will begin on Sunday, January 9, Monday will be open, and meetings will begin on Tuesday, January 11. Except for the popular daily open house, evenings will be free. A plant tour for each industry is also planned. There will be no official headquarters hotel, but board meetings and the N.R.M.C.A. Silver Anniversary dinner will be held at the Columbus Hotel. All meetings are scheduled at the recently-completed Miami Municipal Auditorium in Biscayne Park, which is convenient to all the hotels listed.

Places and dates for later joint association meetings, which were decided earlier are as follows:

1956—Chicago, Ill., February 13 to 17, Conrad Hilton Hotel, with joint machinery exhibition

1957—Los Angeles, Calif., February 11 to 14.

For 1958 tentative reservations have been made at the Conrad Hilton Hotel for a joint meeting and machinery exhibition, but invitations from other cities, including New York with its new Coliseum, are being considered. The decision will be made at the Miami convention. An invitation to hold the 1959 joint convention in New Orleans was accepted. Dates for this event are February 15 to 19 inclusive.

There was also considerable discussion of locations for the 1955 semi-annual joint board meetings. Yosemite and Glacier National parks were suggested, as were also the Del Monte peninsula of California, Lake Placid, N.Y., and Hot Springs, Va. The decision was referred to the executive committee.

Plans were also considered for celebrating the Silver Anniversary of N.R.M.C.A. at the Miami convention. A Silver Anniversary souvenir book will be issued which will contain a report of the history and accomplishments of the association, biographies of past presidents, lists of officers, and other similar information. A feature of this meeting also will be the premiere showing of the ready-mixed concrete film produced for N.R.M.C.A. by the Portland Cement Association. This film will be made available to member companies.

Manufacturers' Division Robert P. McKenrick (Blaw-Knox Equipment Div.) gave his report to the board as chairman of the Manufacturers' Division of N.S.G.A. At a recent meeting in Chicago the manufacturers' board agreed to locate all manufacturers at the Miami convention in one of two hotels for the convenience of producers. It was also decided to add a third colored badge to identify distributors of the manufacturers. In off years, said Mr. McKenrick, there will definitely be no exhibits, no organized entertainment, and no field trips by the manufacturers.

Truck-Mixer Mfrs. Bureau Robert W. Smith (T. L. Smith Co.), chairman of the Truck Mixer Manufacturers' Bureau, said that most of the members feel that the last machinery exhibition in Chicago was a success. Since that convention also a joint committee of truck and truck-mixer manufacturers was formed with the aim of making equipment which will meet the needs of concrete producers. Methods of mounting mixers on trucks are being studied, and the committee is ready to provide a wide variety of information to producers on request.

President Collins mentioned a proposed joint booklet on the repair and maintenance of ready-mixed concrete equipment, and it was voted to go ahead with this. Another booklet was suggested on the selection of suitable mixers and trucks and methods of mounting the mixers.

Walker's Report According to Stanton Walker, concrete problems in general are receiving much attention in the laboratory, and the investigation of admixtures is being continued. The growing use of lightweight aggregates, he said, has created many problems in mixing and handling, which now are being studied.

Mr. Walker again emphasized that ready-mix producers give too little attention to quality and too much to selling and delivery. Sales cannot always be made on the basis of convenience and economy; quality must be kept high and uniform for the continued growth of the industry.

Committee C9 of the A.S.T.M., he reported, has revised its specifica-

Louis C. Schilling and family rode in style from the dock to the hotel. Mr. Schilling is chairman of arrangements for the coming convention in Miami.

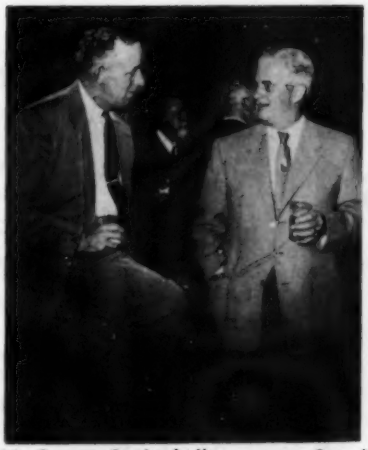
Mr. and Mrs. Charles W. Shirey (C. W. Shirey Co., Waterloo, Iowa); and Mr. and Mrs. E. Phil Gemmer (Texas Construction Material Co., Houston, Tex.).

tions to recognize the new and increased capacity ratings of truck mixers subject to letter ballot. There is still the job of selling these new ratings to some state highway departments. Mr. Walker asked producers to advise him of any difficulties encountered in getting them accepted.

The Corps of Engineers, he stated, has had a policy against ready-mixed concrete on large jobs. Recently the Corps has become interested in commercial plants supplying its projects, and it may require automatic controls, tilting mixers, and separate batching for on-the-site plants where aggregates over 2 in. in size are required. For jobs under 5,000 cu. yd. and aggregates under 2 in. any standard stationary mixing plant can qualify.

Another problem, said Mr. Walker, is the fact that the Corps of Engineers bases its specifications on flexural instead of compressive strengths. Specifications have called for 90-day strengths up to 750 lb., which creates a problem as there is a limit to the amount that flexural strength can be increased by adding cement.

Mr. McKenrick pointed out that the tolerance of specifications is in proportion to the size of the batch; a batcher which is accurate for 5 cu. yd. would be less accurate for a 2 cu. yd. batch. It would mean a big job to convert existing plants to meet these specifications.



M. Eugene Sundt (Albuquerque Gravel Products Co., Albuquerque, N.M.) talking things over with R. P. McKenrick (Blaw-Knox Equipment Div.).

At the joint meeting of the boards Mr. Walker said that since 1937 the University of Maryland has spent over $5½ million on its engineering department, where the association has its laboratory. Now, he said, the Asphalt Institute has made arrangements to erect a private building on the campus, where its offices and other facilities will be located.

In closing Mr. Walker mentioned the coming 5-day short course on concrete and concrete aggregates to be held the week of November 15 and the bituminous short course on December 7, 8, and 9. The coming convention in Miami, he said, will cover many important subjects, including crushing of gravel and sand, screening efficiency, ready-mix operating and maintenance problems, etc. He urged all members to send in suggestions for other subjects to be discussed.

Welfare Provisions It was pointed out that producers of sand and gravel and ready-mixed concrete have a very serious obligation to their employees to protect their interests in dealing with unions on welfare funds and similar subjects. The producer has a criminal and civil responsibility under the law; if an employee can't collect from a welfare fund, he can collect from the employer. Congress is trying to prevent misuse of welfare funds, and employers are permitted to take group action. The joint boards voted in favor of a resolution which would warn members of the two associations to be alert to their responsibilities under the Taft-Hartley Act for proper administration of welfare provisions of labor agreements.

52-Ft. Prestressed Bridge Made by Carter-Waters Called "World's Longest"

What is believed to be the longest prestressed lightweight concrete beam in the world is now in service as a foot bridge in Prairie Village, Kans. This structure is a prestressed post-tensioned beam 52 ft. long, 4 ft. wide, and 1 ft. 8 in. high, with a 50 ft. clear span. It is a modified "T" beam with three vertical members, each of which is reinforced with 24 high-tensile steel wires (¼-in. in diameter) in four groups of six wires each. The bottom group of wires is straight. The other groups form a family of catenaries with deflections from the horizontal of one, two, and three in. respectively.

The bridge was manufactured from Haydite concrete by the Carter-Waters Corporation of Kansas City, Mo. Methods and equipment of Prestressing, Incorporated, San Antonio, Tex., were used, and the latter concern did the engineering and design work on the bridge slab.

Fabricated in the Carter-Waters' plant, the bridge was hauled to the jobsite and placed in only 45 minutes. The structure was transported by means of a pole truck and placed with a pair of Lorain truck cranes.

● The foot bridge at Prairie Village, Kans., believed to be the longest prestressed lightweight (Haydite) concrete beam in the world. The bridge is 52 ft. long, 4 ft. wide, and 1 ft. 8 in. high.

The bridge weighs about 22,000 lb. and contains about 7¾ cu. yd. of concrete. If it were made of regular (heavy) concrete, the structure would weigh approximately 31,000 lb. Six and three-quarters bags of high-early (Type III) cement were used per cubic yard of concrete. The slump was 1½ in. and the cylinders tested 3,246 p.s.i. in two days; 4,691 p.s.i. at 14 days; and 5,720 p.s.i. at 28 days. The initial stress in the wires is 145,000 p.s.i., which includes an allowance of 25 percent for loss of tension in the wire and the creep in the concrete. The stress allowance provides for an additional safety factor of 10 percent because Haydite concrete was used. At the time the beam was cast, exact information on the creep in Haydite concrete was not available. Results of a research program now in progress already indicate that this allowance was excessive, and that the customary 15 percent allowance made for prestressed beams of heavy concrete will probably be correct for Haydite.

STEARNS 50-3 SPELLS PROFIT

...in any man's language!

PROFIT in MORE PRODUCTION...
PROFIT in LESS OVERHEAD...
PROFIT in MORE STEADY CUSTOMERS
through UNIFORM, TOP QUALITY BLOCKS

Here's still another record set by the "new wonder of the concrete block making industry"— the Stearns 50-3 Concrete Block Machine. Just read the following quotation taken from the above recent letter to Stearns from William S. Shaffer, president of Shaffer Block Works, Somerset, Penna., a proud new Stearns 50-3 owner:

> "With our new Stearns 50-3 and five less men, we have more than doubled the combined production of our two former machines."

Enough said! But why not read the whole letter for your own future profit!

STEARNS
MANUFACTURING COMPANY • INC
ADRIAN • MICHIGAN

Complete Concrete Products Plant Equipment — Standard of the Industry

SHAFFER BLOCK WORKS
CEMENT BLOCKS. SAND. SHALE. STEEL WINDOWS
PHONE 483

SOMERSET, PA.
August 27, 1954

Stearns Manufacturing Company, Inc.
Adrian, Michigan

Gentlemen:

We too are more than pleased with our new Stearns 50-3 block machine. The results are beyond our highest expectations.

With our new Stearns 50-3 and five less men, we have more than doubled the combined production of our two former machines.

When better block machines are made, Stearns will make them. That goes for the blocks made on this great new machine as well. All the operator has to do is to start the machine; from there on in it's the Stearns 50-3's business.

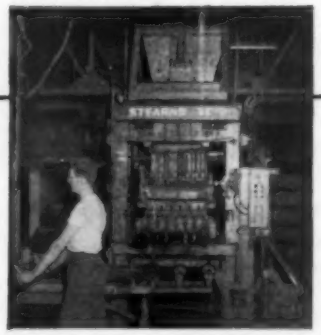
Having used your block machines exclusively since we started operations in 1945, we know Stearns spells "Profit" in any man's language. For top production of quality units, you just can't beat the Stearns 50-3.

We want to take this opportunity to congratulate your company on this new wonder of the concrete block-making industry and to thank you for the fine service and cooperation we have received from you over the years.

Very truly yours,

William S Shaffer

William S. Shaffer, President
Shaffer Block Works



"When better block machines are made, Stearns will make them! For top production of quality units, you just can't beat the Stearns 50-3," says Mr. Shaffer of his new machine, above. Completely automatic with a unidirectional, vibratory heart, the one-man, three blocks-per-cycle Stearns 50-3 is delivered as a complete package, with the Stearns Pneumatic, Magnetic Offbearer and Stearns Automatic Pallet Return with pallet cleaning and oiling mechanism. Operator is Earl Hutchison.

Here is the president and owner of Shaffer Block Works, right, surrounded by his Stearns 50-3's uniform, top quality blocks which mean more steady customers. Nevin Dunmeyer, foreman, left.

Bauer Policy of Quality Economy and Efficiency Promotes Steady Growth

another ON THE SPOT report

THROUGHOUT the country there are numerous firms making concrete building units which have done an excellent job of manufacturing and marketing. These follow no set pattern, each having been intelligently adapted to the conditions in its particular locality. An excellent example is The Bauer Co., Kittanning, Pa., which has grown in capacity and in the variety of its products in an area slow to accept anything new in building materials.

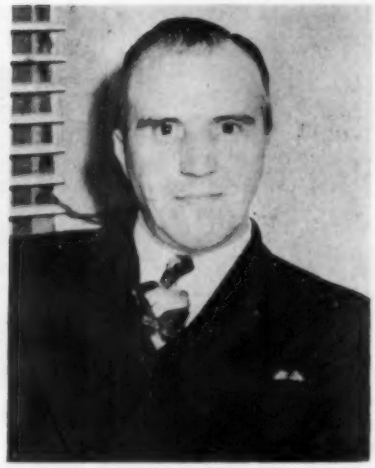
By WALTER E. TRAUFFER

This business was founded in 1922 by Henry and Chris Bauer, who had operated a large mirror-silvering business. The original plant had a Duntile machine, and two tampers were later added. In 1928 the Bauers began to manufacture Ledyard burial vaults, as well as lintels, sills, etc. Ledyard septic tanks were added to the line in 1950.

The plant was expanded in 1944 by the addition of a No. 9 Joltcrete block machine, and a second one was installed in 1946. A C. S. Johnson bin for bulk cement and aggregates was installed in 1945, along with other related equipment. Prior to that time the plant had never produced over 500,000 blocks annually; now it jumped to over 2,000,000. After two new GoCorp Senior block machines were added early in 1951, capacity increased to 3,500,000 blocks annually, operating only one shift. Formerly a partnership, the company is now a corporation with Fred L. Bauer as president, Ralph H. Bauer, vice-president, and Henry Bauer, chairman of the board of directors.

Unusual care is taken in all phases of the operation to insure the economical production of high-grade blocks and other units. Each step in the processing, from batching through curing, is carried out so as to get the best possible results. Only federal or state specification materials are used. River sand and gravel, which varies in shade, is mixed with up to one-third crushed limestone to govern the texture of the finished product. This limestone is also economical as it is a slow-selling by-product of a flux stone plant.

P. & S. Moisture Controls, sold by the Roy Darden Industries, Inc., are used on all mixers to regulate the water, thereby enabling a uniform mix to be used every time. From 4½ to 5 sacks of cement are used per cu. yd., and the yield is 20 to 22 blocks per sack. This is a rich mix for these aggregates, but the intention is to keep all blocks from 50 to 75 percent over specified 28-day strengths. They average between 1,400 and 1,500 p.s.i. of gross area. It has been found that this extra strength results in much less chipping of the blocks in handling, and it also reduces their absorption considerably.



Fred L. Bauer, president of the Bauer Co.

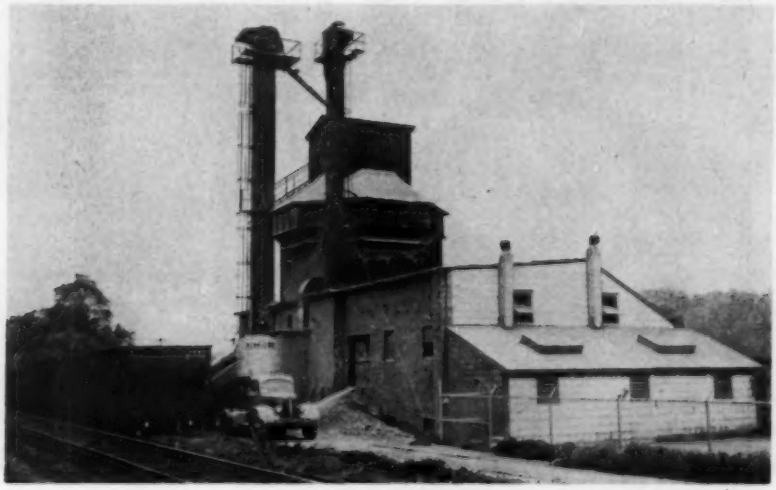
The Bauers believe that the best insurance for uniform high quality lies in experienced operators, but they also consider regular tests necessary. Test cylinders are made for all the products at intervals, and these and block and tile are broken on a Forney's compression tester. Spot checks are also made of stored units from the yard. It is very seldom that a bad unit is found.

The aggregates used in this plant —primarily sand and gravel and crushed limestone—are received by rail or truck and discharged into a hopper. A belt conveyor and bucket elevator carry these materials to chutes feeding the four compartments of a 380-cu. yd. bin. Syntron electric vibrators insure free flowing of the materials from the hopper and through the chutes. Ordinary slag and expanded light-weight slag are also stored for special products.

Cement is received in bulk trucks or cars and is discharged to a hopper. A screw conveyor and bucket elevator carry the cement to a 425-bbl. bin. One of the bulk trucks (illustrated) consists of a White truck-trailer with a special Gramm body. Compressed air jets in this bin insure free flowing of the cement.

An electrically-driven weigh-batcher is used to batch the concrete ingredients and discharge them into any of the four mixers. There are two 42-cu. ft. Stearns mixers, one for a Duntile machine and the other for a GoCorp Junior semi-automatic machine used for making rock-face

A general view of the Bauer block plant at Kittanning, Pa.



A special type of bulk cement trailer delivers cement to the plant; cement is also received in covered hopper cars.

blocks. The other two are 50-cu. ft. GoCorp mixers which supply the two GoCorp Senior block machines.

An interesting feature of the batching department is the home-made dust collecting system which not only keeps the department clean but also reclaims the cement dust for re-use. The collector is connected to the batcher charging and discharge points, and the dust is drawn by a fan into the collector which is actually a 5- by 6- by 8-ft. concrete block expansion chamber with a top vent. The cement is shoveled out at intervals into the cement screw.

Not only the cement dust is saved in this plant. All broken blocks and culls are sold for sump holes and driveways. These are collected in a hopper holding one truckload. When the hopper is full, a lift-truck dumps the load into a truck. Seconds are sold to mines, which require more than are usually available.

The two GoCorp Senior block machines have automatic pallet oilers, height density control and magnetic pallet return off-bearers. They make six standard blocks at one time, and under the GoCorp quality control make 700 blocks per hour each. The pallets are made for the Gene Olson Corporation by the Bethlehem Steel Company. The 108-block racks are made by the Korash Welding Service.

All handling in the plant and yard is done with four Hyster 75 pneumatic-tired fork-lift trucks with 6-ft. lift. Loaded racks are stored in three kilns which hold a total of 18,000 standard units. Due to space limitations in one direction the kilns had to be built 130 ft. long in order to get the necessary capacity. Steam from a 150-hp. boiler is introduced through perforated pipes which extend the full length of the kilns. Steam is turned on as soon as a kiln is full, and is shut off automatically about 3:30 a.m. after 11 to 12 hours of curing. The maximum temperature ranges between 150 and 170 deg. F.

An open shed 80 by 100 ft. is used for the unloading and cubing of all blocks after they are taken from the kilns. Two cubers with four portable turntables are utilized under this roof, which was built to provide shelter for the workers.

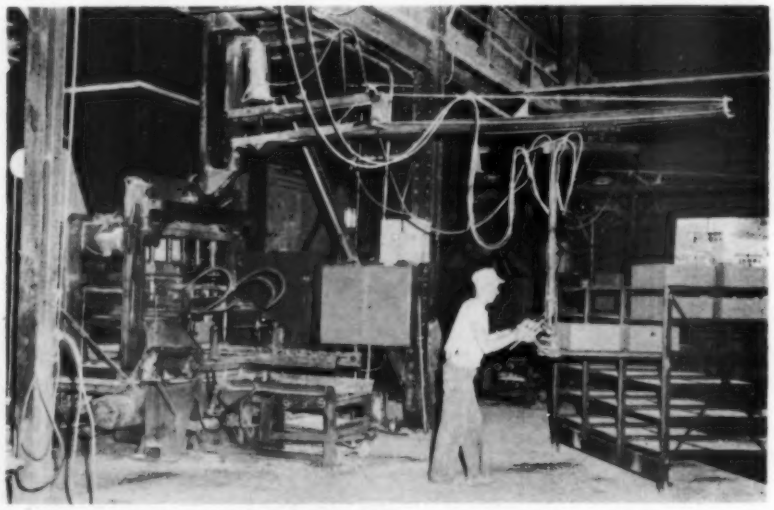
As Kittanning has a population of only 7,700, block must be produced at the lowest possible cost consistent with quality, so that shipments can be made into the surrounding area, with competition only 18 to 20 miles away in every direction. Shipments are being made as far as 70 miles in some directions, but not into Pittsburgh. Blocks are sold to mines, farms, coke plants, etc., as well as for ordinary construction. An 8-in. solid slag block made by the firm for coke oven walls will stand indirect heat up to 1,700 deg. F.

The company employs no salesmen, doing most of its selling through dealers. Newspaper advertising has been found to give poor results, but radio has been an excellent medium. Spot ads used daily on the radio are prepared by a professional.

Right: a fork-lift truck delivering a 108-block rack into a kiln.

Below: One of the mixers used in the block plant, with dust collector connection above.

The Bauer plant utilizes four block machines, including the high-capacity automatic machine shown here, which turns out 700 standard units per hour.



Concrete Mixing Plant Working 24 Hours a Day At Niagara Power Plant

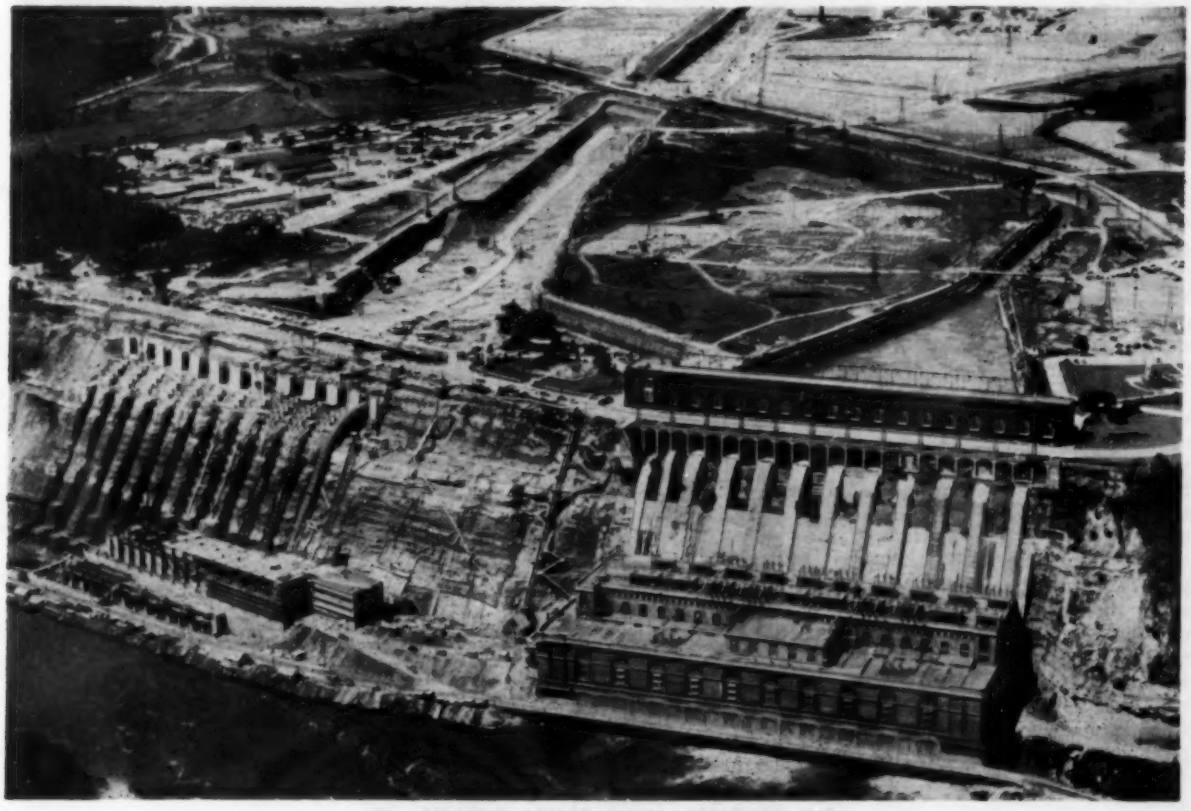
LIKE a continuous flow of molten lava, concrete is being mixed and poured at Ontario Hydro's giant Sir Adam Beck-Niagara Generating Station No. 2 development on a schedule tighter than a railway timetable. If this continuous, 'round-the-clock flow of concrete were interrupted for even half an hour, progress on the various complex features of the project would be slowed down as effectively as throwing a wrench into an automobile assembly line.

But a tight schedule is all in a day's work to the men manning the concrete mixing plants of the project —No. 1 at the Whirlpool Section and No. 2 at Chippawa near the upper end of the development. Taking in cement at these two plants at the rate of 27 railway carloads a day, they are producing concrete at the rate of 7,137 cu. yd. a day for the development's key sections—the intakes, tunnels, canal, and powerhouse—located on the perimeter of the city of Niagara Falls, Ont.

No novel uses are being made of concrete in this vast undertaking. However, three things combine to make the application of concrete on the project outstanding: (1) the greatest volume of concrete ever required in Ontario—1,700,000 cu. yd. to finish the major phase of the project; (2) the speed and precision with which concrete is being utilized; and (3) the unusual topography of the site—running the gamut from 5½-mile twin pressure tunnels being driven at a maximum depth of 330 ft. below the earth's surface, to a powerhouse located at the base of a 300-ft. cliff on the Lower Niagara escarpment. All these elements have presented a constant challenge to the ingenuity and engineering techniques of Hydro's staff.

Briefly, their task at Niagara is this: to draw off 15,000,000 g.p.m. of water from the Upper Niagara River, two miles above the world-famous Canadian Horseshoe and American Falls, and pass it through the concrete-lined twin tunnels which pass underneath the city of Niagara Falls; surfacing, the tunnels will empty into a 2¼-mile open-cut canal leading to the forebay of the powerhouse, some eight miles downstream on the Niagara River from the tunnel intake tubes. Longest haul made by the 46 transit-mix trucks is 3½ miles.

● This impressive view shows the scope of Ontario Hydro's Niagara Project, with its great generating stations, the construction of Sir Adam Beck-Niagara Generating Station No. 2 (left), and the original plant (right). Behind the penstocks and forebays are the canals.



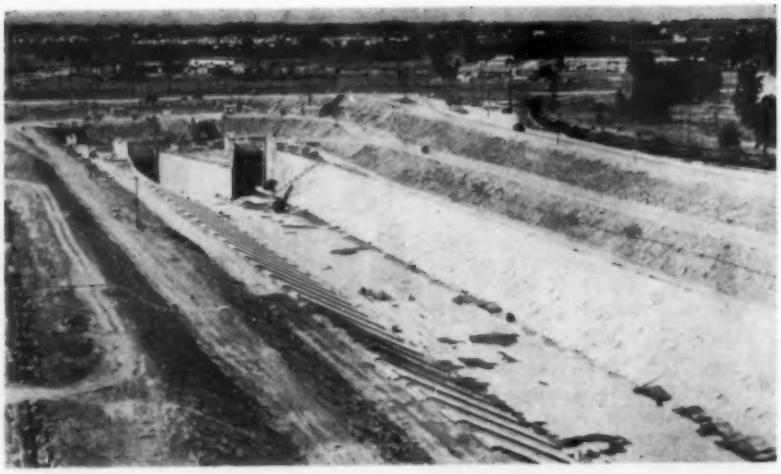
● Outlets where the twin tunnels surface to a 2¼-mi. open-cut canal which will link the tunnels to the headworks. Water will be diverted at a point 2 mi. above the Cataracts into the twin 5½-mi. tunnels, now being carved under the city of Niagara Falls. Average width of the canal is 200 ft., depth (through rock and earth) 70 ft.

Two Plants There are two mixing plants for the project. Each day the two plants—No. 1 at the Whirlpool and No. 2 at Chippawa—produce concrete at the maximum rate of 440 cu. yd. per hr. With the mixing plants taxed to capacity, each day's concrete requirements must be scheduled with extreme care to get the right mix to the right place at the right time. The plants daily feed concrete to the standard conventional dump trucks—Euclids, chiefly—in a steady stream that has an almost polished precision. This pattern has enabled Hydro to produce concrete on the Niagara job at the amazing maximum rate of 33,973 cu. yd. per week from eight automatic batching plants equipped with 2-cu. yd. capacity Smith central mixers.

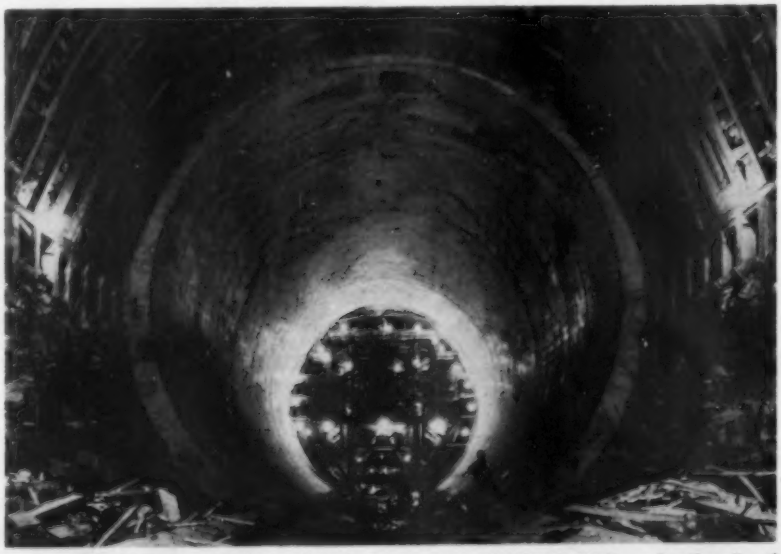
Tunnels Late in the afternoon—almost on the dot of 4 o'clock—the mixing plants must be ready to supply the two contractors preparing to pour the approximately 70-ft. long sections of the arch portion of the concrete lining. Each section requires about 1,150 cu. yd. of concrete, and the pouring operation takes approximately 7 hours. The finished diameter of the tunnel is 45 ft. It takes some 12 hours for the concrete to set and become strong enough to support itself. Then the arch form is stripped and moved to the next section. The pouring and stripping operation takes altogether about 19 hours, of which 4 hours are used in moving and reassembling the arch form as each section of concrete lining is completed. Stripping the form 12 hours after pouring is one of the more remarkable feats that is helping to speed the undertaking to a conclusion.

The whole tunnel operation is somewhat unusual. To introduce concrete into the tunnel, trucks on the surface empty it into 10-in. drop-holes which have been drilled at intervals of approximately 700 ft. along the center line of the tunnels. Down below in the tunnels, a large diesel-powered hopper, running on rails along the tunnel floor, receives the concrete from the drop-holes. In the arch pouring operation, three Pumpcrete machines in each section take over and pump the concrete upward into the arch form. Grouting pipes are left at frequent intervals

(Continued on page 176.)



● One of the two completely-automatic concrete mixing plants in operation at Hydro's Sir Adam Beck-Niagara G.S. No. 2 project. The commission's construction division is providing all the concrete for the development, which will require approximately 1,700,000 cu. yd. (3,500,000 tons). Capacity is 360 t.p.h.



● Two 5½-mi. long tunnels being bored at a maximum depth of 330 ft. under the city of Niagara Falls will carry 15,000,000 g.p.m. of water from the Upper Niagara River to the 2¼-mi. long open-cut canal leading to the forebay of Hydro's 14th new power source. Note the workman, dwarfed by the huge bore of tunnel No. 1. The 3-ft. thick concrete lining reduces the tunnel diameter from 51 to 45 ft.

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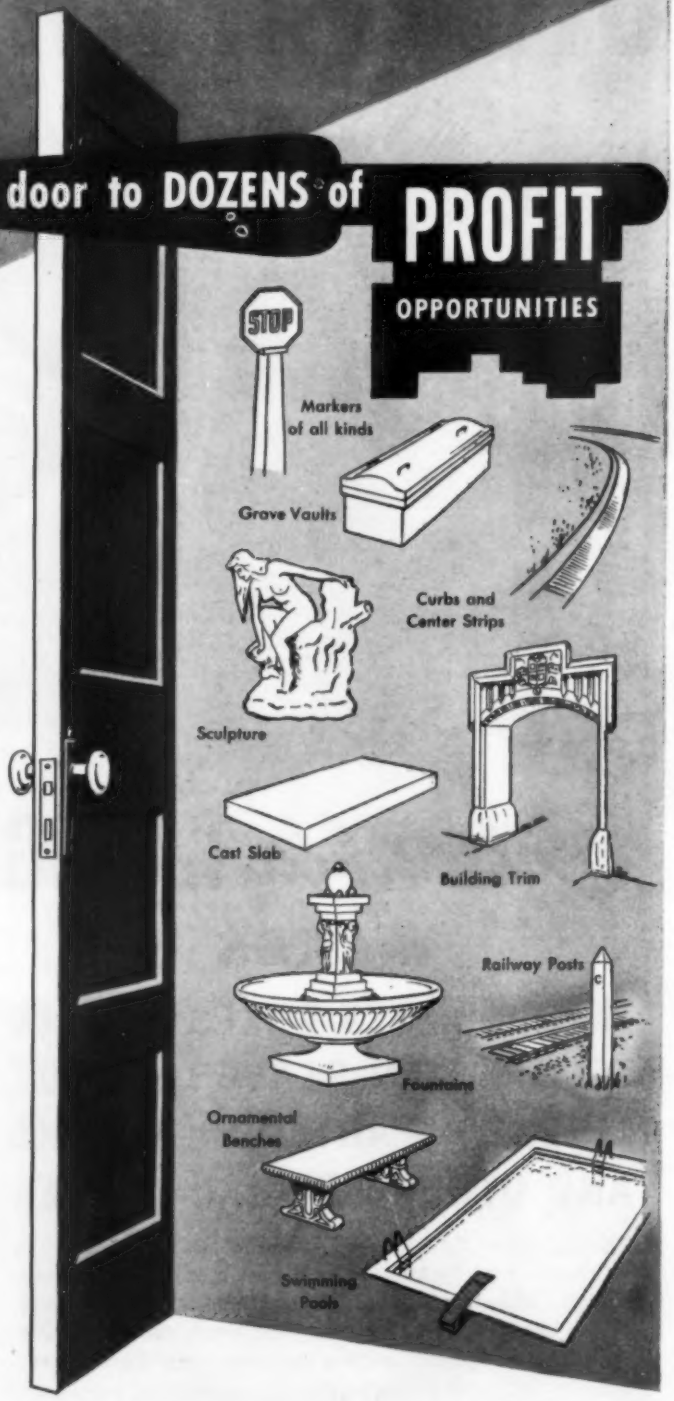

● Medusa White, the original White Portland Cement plain or waterproofed, white or tinted, actually opens the doors to an almost unlimited range of profit possibilities in the concrete products field. Those uses shown to the right are but a few. Wherever greater distinctive character and beautiful color effects are desired, whether it be in cast stone, concrete, cast slabs or any product that is made of concrete it can be made better and more beautiful with Medusa White Portland Cement, or Medusa Waterproofed White Portland Cement.

Now you can begin to see the tremendous sales possibilities for the concrete products manufacturer who utilizes Medusa Diamond-Blue, White (the original white) Portland Cement or its companion Medusa Waterproofed White Portland Cement for making his products. There is no end to the ideas that you can give your customers through the application of these cements to their building requirements. These cements are made by a company producing the finest in regular and special cements for over 60 years. You can rely on their integrity.

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WHITE TILE GROUT CEMENT

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New Pipe Plant in Salt Lake City Uses CEN-VI-RO Process Exclusively

another ON THE SPOT report

"CEN-VI-RO" is the trade-name indicative of a manufacturing process which is relatively new in the concrete-pipe industry. The method derives its name from the system used in molding the pipe, in

By HARRY F. UTLEY

which three forces are applied simultaneously, *i.e.*, the concrete is compacted by CENtrifugal force, subjected to high-frequency VIbration, and pressurized with a heavy ROller.

The process was patented by George R. Jessen, head of the Idaho Concrete Pipe Company of Nampa, Idaho, who recently disposed of 80 percent of his interest to Morrison-Knudsen Company, Inc., of Boise, and the Raymond Concrete Pile Company of New York City. These interests have formed the Cen-Vi-Ro Pipe Corporation, with headquarters in Southgate, Calif., a Los Angeles suburb. Plant and molding equipment are being manufactured by the Conveyor Company, Los Angeles.

One of the newest licensee plants to be erected for the exclusive production of Cen-Vi-Ro pipe is that of the Utah Concrete Pipe Company at Salt Lake City, with Dick Davis as superintendent. While the Salt Lake City operation is initially equipped only for the production of pipe up to 48 in. in diameter, sections up to 84 in. in diameter have been molded successfully by the process.

A general view of the new Cen-Vi-Ro pipe plant of the Utah Concrete Pipe Company in Salt Lake City.

The method is adaptable to the production of all types of pipe, including high- and low-pressure lines, both reinforced and prestressed. In addition, the Raymond concern will henceforth produce the reinforced-concrete tubes needed in the manufacture of Raymond concrete piles by the Cen-Vi-Ro process. Piling of this type is being widely used to support oil and gas production platforms off the coasts of Texas and Louisiana in the Gulf of Mexico.

The concrete used in the process is extremely dry, of practically "no-slump" consistency. The proportion of coarse aggregate is also high, about 70 percent. The maximum of six bags of cement per cubic yard of concrete is used to develop compressive strengths of concrete in the pipe as high as 10,000 p.s.i. Admixtures to aid workability and provide

Right: Concrete pipe is given final pressurizing by a roller in the spinning pipe form. The concrete batching and mixing plant is in the background.

Below: While the form is being spun and vibrated, a workman (rear) hoists another in the jib crane for placing in the machine.

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Every VIBRAPAC Block Maker knows this: VIBRAPAC Concrete Block have won, *on their merit*, the highest respect of the building industry. VIBRAPAC Block combine beauty and utility so desirable in structures of all sizes and types. They provide unequalled permanent structural benefits and economies. • Every VIBRAPAC Block Maker also knows how BESSER pioneered perfection in concrete block . . . and how Besser advertising has been telling the entire building industry ALL THE FACTS about the superiority of this modern masonry material. No doubt about it . . . the mounting trend toward VIBRAPAC Block and BES-STONE Split Block for exteriors and interiors is solidly founded on Besser's continuous promotion, plus highest standards of beauty, permanence and other practical qualities of VIBRAPAC Block.

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1904-1954

...a Half Century of Concrete Masonry Progress!

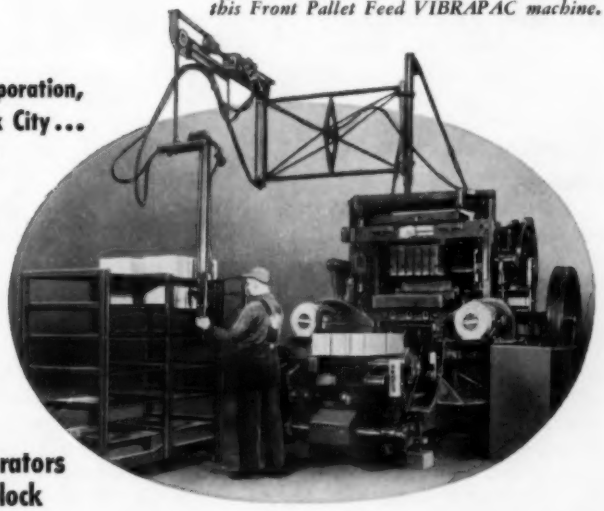
Boost Concrete Block SALES!

Besser advertising in magazines of worldwide circulation builds solid foundation for progress for all VIBRAPAC Block Makers

The aim of these millions of Besser ads is to pre-sell the products of VIBRAPAC Block Plants throughout the world to all those responsible for better building design, engineering and construction. This continuous campaign boosts demand and increases block sales.

◀ **EXHIBIT UNITS for HOME SHOWS and EXPOSITIONS or CONVENTIONS are loaned without charge to VIBRAPAC Block Makers who want to exhibit locally**

Up to 7500 units per day can be made on this Front Pallet Feed VIBRAPAC machine.



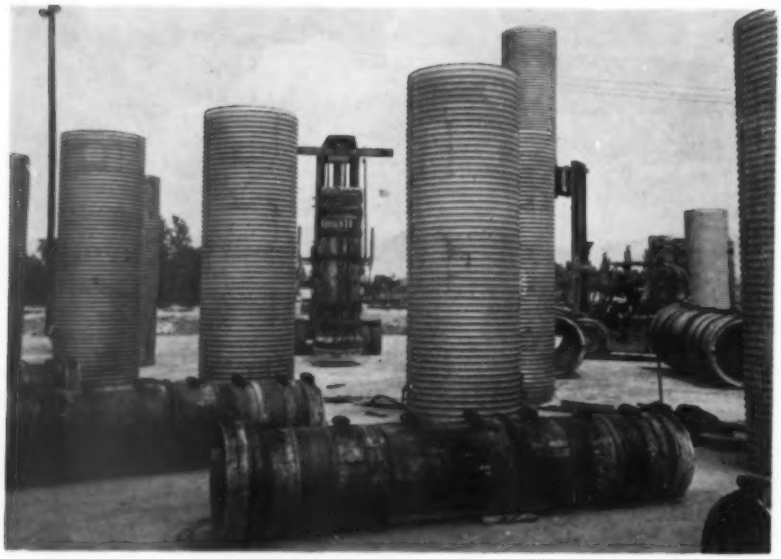
▼ **BESSER Exhibit at Architects' Samples Corporation, 101 Park Ave., New York City... visited annually by thousands interested in progress in architectural design, engineering and construction**

★

Write **for data on how BESSER helps VIBRAPAC Plant Operators make and sell more block**

BESSER COMPANY • Alpena, Michigan, U.S.A.

J 3544



In the yard the forms await stripping and curing inside the individual corrugated steel jackets.

other advantages may be used if desired, although none is incorporated in the mix at the Salt Lake City installation. Hyster grapple trucks handle the filled forms and the finished pipe, and each section is steam-cured inside an individual corrugated-steel jacket.

Mixing is carried on for a sufficient time to assure uniform dispersion, as well as complete hydration of the cement. While the steel forms are spun on rubber-tired trunnions, the concrete is placed in uniform layers by way of a long, narrow trough housing a belt-conveyor which moves forward and backward within the spinning form. The charging belt and revolving form are pushbutton-controlled by an operator. During the charging process, vibration is also applied to the underside of the form by four vibrators of a special type. Steel reinforcing is not displaced during the molding process; and after full wall thickness is attained, the concrete is finally compacted by pressure applied by a steel roller.

After pressurizing, the roller is released, and the form is spun at high peripheral speed for a moment to bring a slight amount of cement mortar to the interior surface. This procedure, plus a final screeding, develops a smooth, hard, low-friction surface within the pipe. Maximum absorption is reportedly only 1½ percent.

Pipe sections are generally manufactured in 7½-, 10-, and 12-ft. lengths, depending upon diameter, for convenience of transport and to speed laying at the job site.

Although the process employs only the minimum of reinforcing steel and less cement (comparatively) to reduce the manufacturing cost, strengths and densities are said to be well in excess of standard specifications. This is no doubt due to the use of the dry mix, which guards against segregation due to centrifugal packing forces. Firm bond between the concrete and the steel is created by the application of vibration during spinning.

Joints are sealed through the use of a rubber "O"-type ring gasket, which is placed in the spigot end during laying. It is said to assure a watertight joint under practically any service condition, allowing considerable movement due to expansion and contraction, settlement or lateral displacement, without loss of the seal. Mortar joints are not necessary, company spokesmen state.

Cen-Vi-Ro pipe was first manufactured commercially by Mr. Jessen two or three years ago at Nampa, Idaho, where nearly 20,000 ft. were supplied in diameters from 18 to 30 in. for a new sewerage system. Other installations of recent date have included 24- to 48-in. lines for the Bureau of Reclamation on the Minidoka Project in Idaho and the Gila Project in Arizona; a 36-in. water-supply line at Orleans, Nebr.; 72- to 78-in. diameter sewers in Sacramento, Calif.; and 18- to 36-in. water-supply lines at Clearfield and Brigham City, Utah.

About a half-dozen concerns have already been licensed to produce pipe and cylinders by the process in California, Idaho, Utah, Arizona, Nebraska, and Louisiana.

Niagara Power Plant

(*From page* 170)

in the arch form. Approximately 950,000 cu. yd. of concrete will be used in lining the inside of the twin 5½-mile pressure tunnels.

Intakes Ontario Hydro's own construction forces are pouring concrete at the intake structures which are each designed to draw off some 20,000 cu. ft. of water per second from the Niagara and divert it through the tunnels. The intake structures, which are being poured directly by buckets, will require some 112,750 cu. yd. of concrete to complete. A remedial dam, designed by Ontario Hydro engineers as a result of studies in cooperation with United States engineers, will eventually be placed in the river above the Falls as a means of controlling the flow over the Falls and thus preserving and enhancing the scenic beauty of the famous tourist attraction. The dam will be of concrete construction, and plans tentatively call for the concrete to be placed by buckets, when it is started early in 1954.

Tunnel Outlets Another 39,000 cu. yd. of concrete will be hauled to the outlet portals linking the tunnels to the open-cut canal. At this juncture is the 2,200-ft. long trapezoidal section traversing an earth-filled prehistoric gorge. Here, concrete is poured directly from ready-mix trucks to the sloping sides of the canal. This is the only portion of the 12½-mile canal which will be concrete-lined. The remainder is excavated through solid rock.

Powerhouse The most unusual task is the engineering job being performed at the cliff face, where Hydro forces have been busy since early last summer placing the 19-ft.-diameter steel penstocks on concrete saddles which eventually will be fully enclosed in concrete. The Niagara escarpment here is 300 ft. in depth, and the penstocks are being laid on a sloping rock face at a 60-deg. angle from the horizontal. The concrete is chuted down the face of the cliff in 12-in. diameter steel pipes, a distance of 290 ft. This continuous length of pipe is so fabricated that any 20-ft. section can be completely revolved independently of the rest of the pipe. To prevent segregation in chuting the concrete down the pipe, the concrete is allowed to impinge itself in a 4-cu. yd.

(*Continued on page* 182)

HEADQUARTERS FOR BLOCK PLANT EQUIPMENT

We make . . . .

- TRI-MATIC BLOCK MACHINE (1000 - 8" BLOCK PER HOUR)
- 50 Cu. Ft. MIXER
- SKIP HOIST
- FRONT PALLET RETURN
- HEIGHT & DENSITY CONTROL
- PALLET CLEANER
- REPLACEMENT PARTS

We also sell . .

- YARD-BIRD SWEEPER
- FORNEY TESTERS
- BLOCK SPLITTER
- LT. WEIGHT OFF-BEARER
- OPERATION TIME RECORDER
- SPECIALIZED TOOLS

We rebuild . .

- MOLD BOXES
- STRIPPER HEADS
- VIBRATORS
- PULLEYS, SHAFTS, etc.

FOR THE BEST IN EQUIPMENT AND SERVICE BY FOLKS WITH OVER 30 YEARS OF BLOCK MAKING AND MACHINE BUILDING EXPERIENCE, CONTACT . . . . .

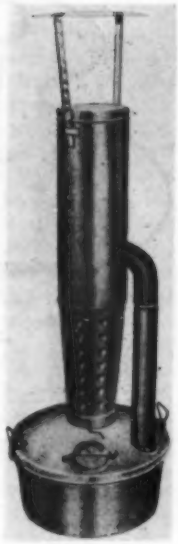
BERGEN MACHINE & TOOL CO., INC.
NUTLEY, N. J.

IN CANADA : Construction Equipment Co., Ltd., Toronto
Halifax, Montreal, London, Edmonton

CM New Machinery and Supplies

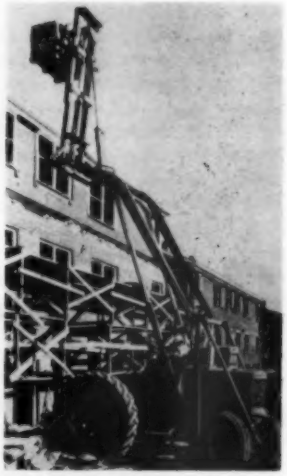
● Larger loads are possible with Dart's new double tandem chassis for mixer mounting. Designed for 54-60,000 GVW, it carries a 45,000 lb. payload. Powered by 178 or 200 hp engine, it has a 5-speed main transmission, finger-tip steering, extreme maneuverability, and a one-man cab. **(101)**

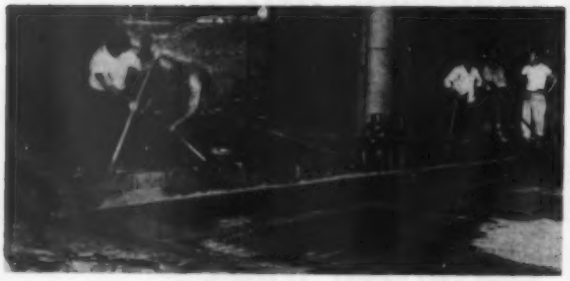
● Efficient spot and space heating, indoors and out, is provided by Scheu's portable HY-LO oil-burning salamander. Smokeless in operation, it produces 70-140,000 BTU using less than a gallon of fuel. Lit by match, it burns 10 to 20 hours per filling. A special damper gives quick, sure extinguishing. **(102)**



● Any standard truck can be fitted for hauling and handling with a new self-contained hydraulic Truck-Crane. It will handle precast slabs, pallets of block, etc., weighing 5,000 lb., swing the load onto the truck, lift it off and spot it anywhere within a 16 ft., 280 deg. radius. The complete unit uses 18 in. space behind the cab. Control panels are on both sides of the truck. **(103)**

● Job-site materials handling is expedited by this Util-A-Lift, an industrial type hydraulic hoist mounted on a wheel tractor. It lifts 1500 lb. to a 25 ft. height, and can handle 5,000 lb. with additional rigging. The unit has a 17 ft. turning radius. **(104)**

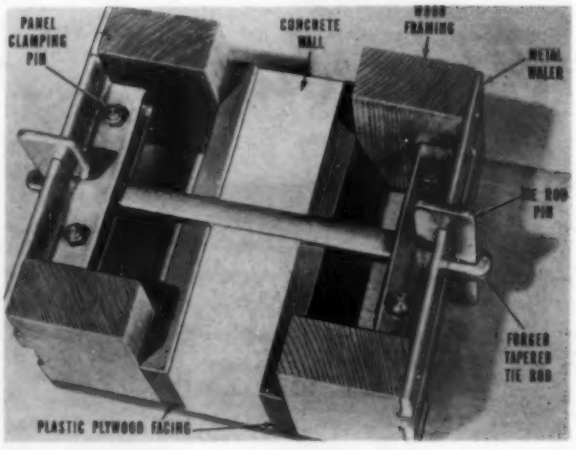


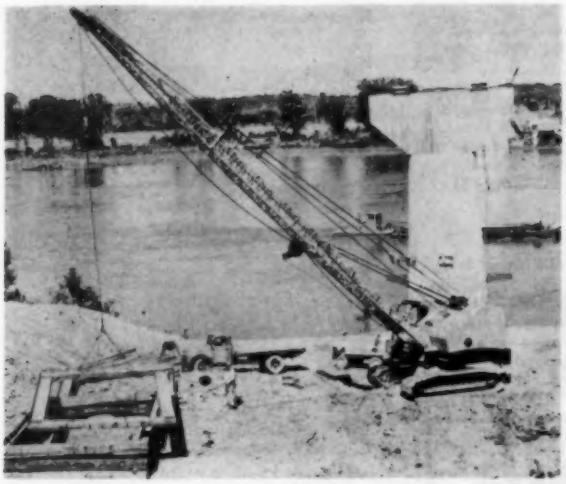


● A 33-ft. vibrating screen developed by Stow uses cables instead of tie rods to prevent sag. The end assemblies are mounted on Uni-Struts for easy sliding and for adjusting to different length spans. **(105)**

● Adapted for testing 6x12-in. cylinders, Forney's QC-100 concrete tester has a 125-ton ram pressure, weighs 1200 lb., stands 65-in. high, 39 wide, 20 deep and sells for $885. Ruggedly built, it can be installed on a trailer for field use. **(106)**

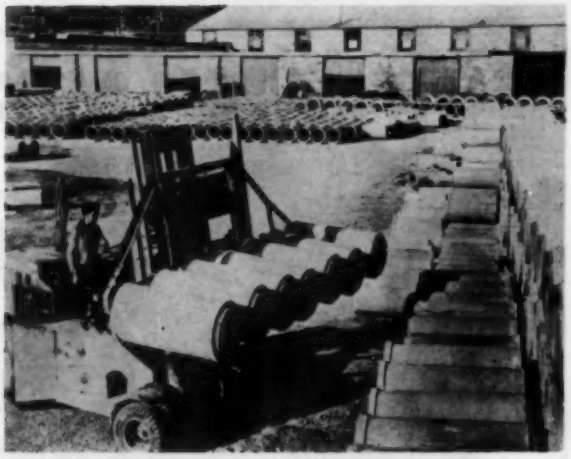
● High-speed concrete forming for reinforced concrete homes and light industrial building is offered by the Rocform system. Fast set-up and stripping lets you pour a 34x40-ft. house in five days, complete with outside and inside walls, roof, outlets, windows, etc. **(107)**



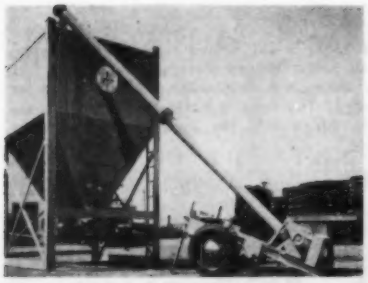


● Modern design throughout highlights the new Koehring 405, a 20-ton capacity crawler crane. Very light for its capacity, it converts easily to other excavator machines. **(108)**

● Light in weight (6300 lb.), this new Challenge 5½-yd. mixer is ruggedly built to legally carry the full-rated capacity payload (in 38 states) on the standard 3-axle truck used by many 4½-yd. mixers. **(109)**



● High capacity Clark-Ross fork trucks used by Sherman Concrete Pipe Co., Knoxville, Tenn. release 8-10 men for other duties. Here, a 5-ton machine handles 5 pipes at a time. A big 13-ton model, using a boom and cable, removes 20,000 lb. units from their forms. **(110)**



● Cement and other dry granular products are transferred by Delta's new portable screw conveyor, the Ba-Zooka, into its giant new 540-cu. ft. Mud Hopper. The elevating screw adjusts from 6 to 16 ft. heights. The hopper weighs 5000 lbs., stands 14 ft., is 9 ft. wide and 7½ deep. **(111)**

● Three styles mark a new line of Edmont plastic work gloves. "Green Turtles" come in a palm coated knitwrist, a fully coated knitwrist, and a fully coated 12-in. gauntlet. The dark green plastic resists abrasion, chipping and peeling, and is liquid proof. **(112)**

OCTOBER 1954

MORE INFORMATION PLEASE

THE CONCRETE MANUFACTURER
431 S. DEARBORN ST.
CHICAGO 5, ILLINOIS

Please send more information on items described in editorial columns of this issue, as circled below.

101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135					

Name_____ Title _____

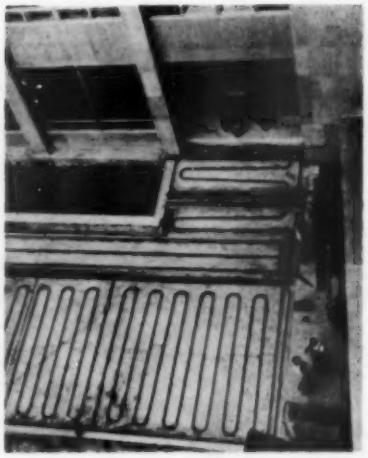
Company_____

Address_____

City_____ Zone_____ State_____

● Lifting 6000 lb., this 4-wheel-drive Fork-loader has been introduced by Baker-Lull for heavy duty in rough terrain. It has 5 speeds forward and reverse, a 100-in. wheel-base, all-wheel traction (the rear axle oscillates) and low pressure hi-flotation tires. Lifting is hydraulic. Gas or diesel-driven units are available with various steering combinations. (113)

● Wintry hazards are eliminated from concrete pavements by the installation of wrought iron pipe coils when the concrete is being laid. The practice is growing, as this A. M. Byers installation in a Michigan state office building indicates. (114)



FOR BATCH MIXING

There Are 6 Advanced

KENT UNITS

Long experience is reflected in those sturdy machines designed to give large output with minimum operating and maintenance costs.

Constructed entirely of steel with hardened replaceable linings.

Heavy duty mixing blades correctly designed for rapid, thorough mixing.

Positive Conway Clutch with V-type positive belt drive.

Anti-friction bearings. Explosion proof motors. Cut tooth gearing.

Self cleaning discharge gate at rear.

Safety grid and watering equipment not shown.

Capacities: 12, 18, 24, 30, 42 and 50 cubic feet per batch.

Write for details and prices.

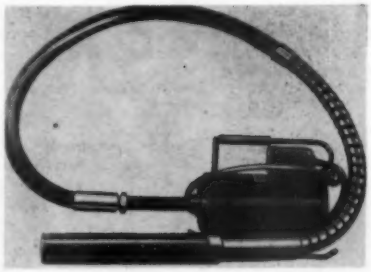
The KENT MACHINE COMPANY

CUYAHOGA FALLS, OHIO

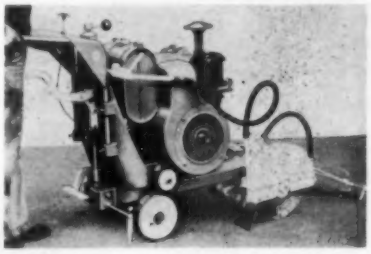
CONCRETE PRODUCTS MACHINERY SINCE 1925

Canadian Distributor: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

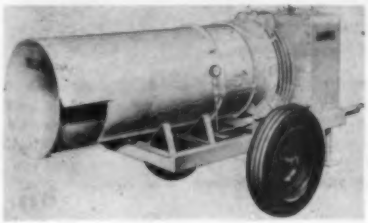
● Developed for use with electric power, this lightweight Roeth vibrator develops 2 hp under full load, and has up to 8000 vibrations per minute. The motor weighs 32 lb. (115)



● Light in weight and highly maneuverable, this Felker 200 concrete cutter performs like a heavy machine, cutting 3¾-in. deep or more. The feed is hydraulic to gently ease the blade into the work for longer blade life. (116)



● Highways, ditches, culverts, foundations and other outdoor concrete construction can be cured with this large mobile Besler heater. The Bes-D-Frostr lights instantly, produces 1-4-million BTU an hour, uses fumeless low-cost fuel, needs no flue, and blows warm air uniformly over large areas. One man moves it. (117)



New Literature

PALLET RETURN that saves you handling a carload of steel a day by hand (described in September, item 124) is adaptable to all block machines of the Vibrapac-type but not to others, *Stearns Mfg. Co.* says. **(118)**

LIFT TRUCK. Trunnion-mounted steering and pneumatic tires feature the *Hyster* YT-40 lift truck, a 4000-lb. capacity unit for all purpose duty, inside and outdoors, in block yards, pipe plants, etc. **(119)**

MIX-ON-JOB. A cost-cutting program outlined by *Cimco* utilizes Twin Bin concrete batchers for on-the-job mixing. The portable or stationary units handle batches up to 1000 lb. **(120)**

BETTER CONCRETE results from using Pozzolith, says this *Master Builders* booklet, showing a great variety of prominent structures that have used it. The dispersing agent makes 5.1 bags of cement do the work of 6 and cuts maintenance costs considerably, MB says. **(121)**

HIGHWAY NEEDS. Forms for making curbs, cribbing, guard rail and the like are shown in *Binghampton Metal Forms* leaflets. **(122)**

PALLET AND LIFT TRUCK made by Truck-Man division of *Knickerbocker Co.* range from skid lift pallet toters to high-lift fork trucks, this catalog shows. **(123)**

AUTOCLAVE. High pressure curing of concrete block can be done with *Bros* welded steel ASME code vessels. Fitted with quick-opening door, the 128-ft. long, 8½-ft. diameter autoclave holds 3,672 block per loading, is made of ¾-in. steel for 150 lb. working pressure and 28-in. vacuum. **(124)**

BEST-SELLERS. Fourteen ways to sell concrete fence posts are shown in this *Wm. M. Chase* literature. Chase furnishes 8-ft. by 25-in. molds that make five posts at a time. **(125)**

PORTABLE HOIST TOWER. Ready-rigged, self-erecting, this heavy-duty *Buck* tower has a two-wheelbarrow platform or a self-dumping concrete bucket. Powered by electric motor or Wisconsin engine. Has retracting wheels. **(126)**

PAVISH CONCRETE WORKS
EAST ALTON, ILLINOIS

LEFT TO RIGHT: PAUL PAVISH, L. J. PAVISH, LEO PAVISH, JR.

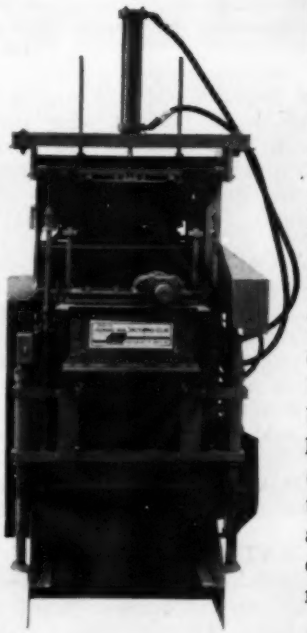
These men demand

PERFORMANCE

and *get* it . . . from their

FMC-180

FULLY AUTOMATIC CONCRETE BLOCK MACHINE



The men from Pavish wanted a machine that would give *performance* — efficient, economical, trouble-free performance, year after year. That's why they chose Fleming's FMC-180, for a smooth operation *at the touch of a button!* They wanted the 180 because it produces clean, sharp-edged blocks on plain pallets: because it eliminates the need for an extra man: because it vibrates under pressure; because of its efficient, economical hydraulic power plant. They obtained *all* these money-making features in the FMC-180 — and *you can too* — at a cost *far less* than any other comparable precision-engineered block machine on the market today!

MAIL TODAY!

FLEMING
MANUFACTURING CO.
489 FLEMING AVE.
CUBA, MO.
PHONE: CUBA 400

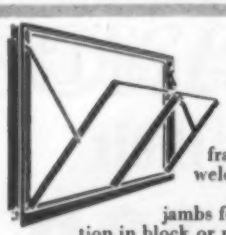
Gentlemen:
Please rush complete information, including specifications, prices and terms on the low-priced, fully-automatic FMC-180 concrete block machine.
Also request information on:
☐ FMC-400 Automatic Double Block Machine
☐ FMC Stationary Mixers
☐ Flem-Stone Automatic Block Splitter CM

Name_____
Firm_____
Address_____
City_____ Zone___ State_____

For better, stronger window installations

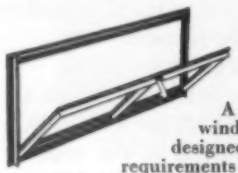
VENTO

BONDERIZED STEEL BASEMENT WINDOWS



VENTO "CHAMPION"

Sturdy 14 gauge frame, electrically welded throughout. Fins integral to jambs for easy installation in block or poured concrete walls. A redesigned cam latch and slotted opening allow greater tolerance, insuring positive operation and latching under all conditions. Available in three standard sizes, putty or puttyless glazing.

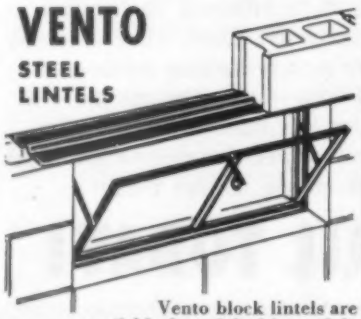


VENTO "THRIFTY"

A real economy window especially designed to meet the requirements of lower cost housing. An attractive window of sturdy construction, smooth operation, two position ventilation and easy sash removal. Fin flanges at jambs for quick installation. Available in three standard sizes, putty type.

AND

VENTO STEEL LINTELS



Vento block lintels are available from 2 ft. 6 in. to 5 ft. Formed from 10 gauge hot rolled steel with stiffening crimp in center. Beveled edge provides masonry bond and seat for mortar. Saves costs through use with standard 6-inch and 8-inch blocks. Vento pressed steel angle lintels for brick construction also available.

ALSO casement, utility and barn windows. Write for full information.

VENTO STEEL PRODUCTS CO., INC.

254 Colorado Ave. Buffalo 15, N. Y.

STEEL FORMS FOR SALE. "Lifetime" forms, adaptable to a great variety of concrete construction, now can be purchased outright from *Economy Forms Corp.*, supplier of rental forms and manufacturer of specialty forms. **(127)**

ANTI-BUILD UP. Metal surfaces liable to concrete build up when coated with brushed-on *Edi-Cote 103* release agent clean off easily with a putty knife at the end of a days production. **(128)**

TRUCK CRANE. A 5-ton, truck-mounted, full-revolving crane shown in this spec sheet from *Quick-Way Truck Shovel Co.* converts to a 1/3-yd. shovel, dragline, backhoe, etc. **(129)**

CLUTCHLESS fork truck drive—the Hydratork—made especially for industrial trucks by *Clark Equipment Co.* combines torque converter and a new constant-mesh transmission for better operation, this brochure shows. **(130)**

STEP MOLDS. Metal forms, precision-built to produce steps that need no hand finishing, can bring big dividends for a small investment, says this literature from *Roger F. Williams.* **(131)**

CALCIUM CHLORIDE in concrete is discussed in this new 40-page manual from the *Calcium Chloride Institute.* Data is given on initial and final set, early strength, ultimate strength, integral curing, workability and density, resistance to surface wear, cold weather protection, air-entrained concrete, high early strength cement, etc. with several charts and illustrations. **(132)**

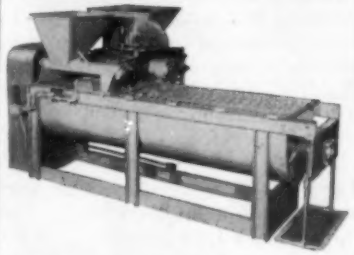
OPERATION RECORDER for block machines, made by *Foxboro Co.* to help you increase output, is described in this data sheet. **(133)**

GLAZED BLOCK. A method for putting ceramic glaze on concrete block has been developed by Allied Engineering Division of *Ferro Corp.* **(134)**

ELASTICRETE. Differing from other cellular concretes (uses ordinary sand and cement), lightweight *Elasticrete* is made with a process and material developed in Germany. It is insulating, sound-absorbing, moisture-resistant, weighs 42% of ordinary concrete and has 1/10th as much shrinkage. **(135)**

***Jones* (formerly Yoder)**

CONTINUOUS MIXER



Embodies many successful new features, such as positive, non-clogging, vibrating belt feed, insuring constant volume of aggregate regardless of moisture content—no need for costly weighing equipment and moisture determinations.

Accurate proportioning through adjustable aggregate gates. Variable Speed drive for requirements ranging from 5 to 20 cu. yds. per hour. Cost only half that of batch mixer. More thorough mixing—gives up to 50% higher strength than 5-minute batch mix. Special advantages for lightweight aggregates. Illustrated literature and other information on request.

J. A. Jones CONCRETE MACHINERY

108 Horning Road, Pittsburgh 34, Pa.

Servicised

form oil concentrate

★ *Reduces Form Oiling Costs*
★ *Easier to handle...less bulk... less storage space...less waste*
★ *Provides good separating membrane*

Servicised Form Oil Concentrate provides greatest economy and flexibility in use because it can be diluted with up to 12 parts of water without losing its adhering or protective qualities. Labor and haulage costs are minimized because sufficient quantities of form oil can be made up on the job as needed. The concentrate is harmless to skin and clothing . . . non-inflammable and resistant to freezing in concentrated form.

Available in 5 gallon cans and 53 gallon drums.

SERVICISED PRODUCTS CORPORATION

6051 W. 65th St. • Chicago 38, Ill.

Niagara Power Plant

(From page 176.)

baffle box to break the momentum of the fall.

The concrete then overflows into the wet-batch hopper for feeding into either of two Pumpcrete machines which pump the concrete into any section of the 1,000-ft. long powerhouse. There is no remixing necessary at this point other than in that provided by the Pumpcrete machines.

Other Concrete Numerous other uses of concrete will be for foundations for the switching structures, tower footings, cable trenches, bridges (two small bridges, one to link to the powerhouse and the cliff, and the other, at the cross-over of the canals). The cliff-facing between the concrete-inset penstocks will also be given a thin layer of concrete to minimize rock displacement and weathering. Retaining walls will be constructed at the intake site and other points.

Vitally concerned in this immense project is Hydro's Strachan Avenue Laboratory at Toronto, which is outstanding in the field of electrical utility research. Research engineers are keeping a finger on the pulse of the concrete mixing plants, checking the concrete used. Sample batches are minutely checked by laboratory men working right at the project. A further step in the lab's checking is the creation of a "concrete cemetery"—a unique graveyard for cylinders of concrete labeled with little white crosses. These cylinders will be opened at intervals of 50, 100, or 200 years, permitting engineers to see how different concrete mixes stand up to the rigors of time. Hydro has concrete cemeteries at numerous other stations — Des Joachims on the Ottawa River, Chenaux, Aguasabon, and George W. Rayner in northwestern Ontario.

The 35th annual convention of the Wisconsin Concrete Products Association will be held at the Plankinton Hotel in Milwaukee on January 12 and 13, 1955, according to an announcement released by Edwin B. Bartlett Jr., secretary. The annual banquet is scheduled for January 12.

German cement exports dropped sharply from DM 60,900,000 in the first half of 1953 to DM 34,700,000 during the corresponding period in 1954. In the January-June period of 1952 exports were valued at DM 71,600,000.

How THORITE *patches and* THOROSEAL *seals concrete structure of building and give it that new look!*

Abrasive Products Company
Braintree, Massachusetts

1 Before patching with Thorite, loose concrete is removed and rust cleaned from reinforcing rods.

2 Thorite is then applied, bringing patch to surrounding surface. THORITE will not shrink.

3 A coat of Thoroseal is then given the patched section and all exposed concrete of similar areas. This building has been restored to its original structural lines and protected from further deterioration.

THOROSEAL seals water out as it beautifies the masonry surface.

Get our pictorially-described literature in detail "HOW TO DO IT."

Standard Dry Wall Products, Inc.
NEW EAGLE, PENNSYLVANIA

HERE SOON

new!

sensational

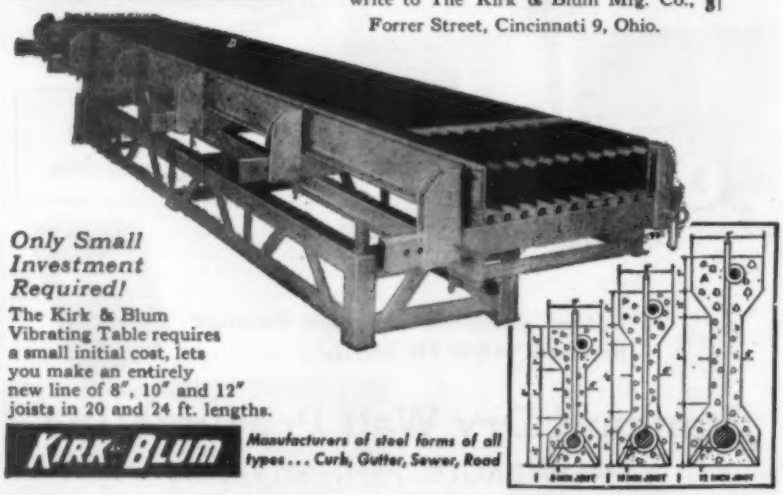
Pacemaker truck mixer

Add a New Profit-Maker

Increase Your Volume

PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE . . .

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 81 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

KIRK BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

Safety Award Winners

(From page 159.)

*Meyer Ready-Mix Concrete, Cadillac, Mich.
Milne Ready Mixed Concrete, Inc., Boulder, Colo.
***Mooney Bros. Supply Co., New Castle, Pa.
Nelsen Concrete Culvert Co., Inc., Mt. Vernon, Ill.
**Randecker Brothers, Lock Haven, Pa.
***Ready Mixed Concrete Co., Annandale, N. J.
F. M. Reeves & Sons, Inc., Pecos, Tex.
***Shamokin Ready Mixed Concrete Co., Shamokin, Pa.
**Shawnee Ready Mix & Asphalt Co., Inc., Plymouth, Pa.
*Thorn's Ready-Mix Concrete Co., Inc., Springfield, Utah
The Trumbower Co., Inc., Nazareth, Pa.
*Turnbull Fuel & Building Supply Co., Hamilton, Ohio
U. S. Concrete Products Co., Upper Sandusky, Ohio
Wagoner Supply Co., Salisbury, N. C.
**Waverly Ready-Mix Co., Waverly, Iowa
*Wentzville Concrete, Inc., Wentzville, Mo.
Wisconsin Valley Concrete Products Co., Wisconsin Rapids, Wis.
*Wolf Ready Mixed Concrete Co., Logansport, Ind.
Woodward-Pollock Lumber Co., Coldwater, Mich.

Additional recognition is given to the 26 companies with asterisks preceding their names: one asterisk, accident-free record for two consecutive years; two asterisks, accident-free record for three years; three asterisks, accident-free record for four years; four asterisks, accident-free record for five years.

The PIT AND QUARRY trophies will be presented to the winning companies in the three divisions at the N.R.M.C.A. convention in Miami, January 9 to 13, 1955. Certificates of Achievement in Safety will be mailed by the Association to accident-free companies which did not win a trophy. All production and distribution employees of each of the three trophy-winning companies will be awarded a Certificate of Accomplishment in Safety.

This year 180 companies submitted reports, compared with 202 companies last year and 182 companies in 1952. These 180 companies produced 15,787,377 cu. yd. of concrete.

Officials of the Southern Heather Stone Sales Corporation have announced the transfer of the firm's general sales office from Roanoke, Va., to Winston-Salem, N.C.

S.E. Regional N.C.M.A. To Hold Annual Session At St. Petersburg, Fla.

November 22, 23, and 24 are the dates for the 11th annual Southeastern Regional meeting of the National Concrete Masonry Association at St. Petersburg, Fla., according to word from George W. Katterjohn, of the Southeastern Concrete Masonry Association. Sessions will be held at the Soreno Hotel.

Business will be transacted during the morning sessions, and afternoons will be devoted to inspection trips to view the varied uses of concrete masonry in this area. Various recreational events have also been planned for the three-day affair. A bus trip over the newly opened Sunshine Skyway Bridge to Sarasota will be a special feature.

9th N. C. M. A. Short Course Scheduled for Nov. 15-19

Final preparations are nearing completion for the ninth annual short course of instruction on concrete and concrete aggregates, to be held at the University of Maryland, College Park, Md., from Monday, November 15 through Friday, November 19. The course is sponsored jointly by the National Ready Mixed Concrete Association, the College of Engineering of the University of Maryland, and the National Sand and Gravel Association.

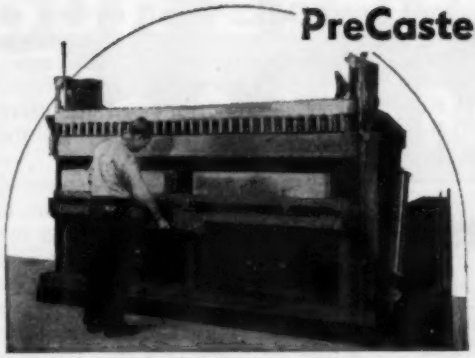
Because of the limitations of classroom facilities, laboratory space, and teaching staff at the university, not more than 125 students may attend. These are to be representatives of member companies of the associations, both active and associates, and a very few invited guests. A preliminary program of the course will be available late in October.

Standards Bureau Okays Revision of Building Code

American Standard Building Code Requirements for Masonry, National Bureau of Standards Miscellaneous Publication 211, a revision of an earlier edition (1944), has been approved by the American Standards Association.

This book is a complete code of minimum requirements for masonry construction, including definitions, requirements for materials, allowable stresses, and general requirements for all types of masonry except reinforced masonry and thin veneers. It may be obtained from the Government Printing Office, Washington 25, D. C. Price, 20 cents. (Foreign remittances must be in U. S. exchange and should include an additional one-third of the price.)

PreCaster magic



profits from hard to make units

• Be the first in your market to offer quantity production prices on concrete units that will strip through a straight box . . . slabs, lintels, highway guard rails, posts, fence posts, joists, parking lot markers, channel roof, etc.

• Now you can book volume orders for any of these precast concrete units . . . hard to make by hand methods. Cut costs by Pre-Caster's fast production and build handsome profits . . . better than 100% markup.

• Write for data sheet and price list.

• *Extra heavy* . . . stripper head frame of two heavy 2" x 3" cold rolled steel bars.

• Superb electrical vibration from two V-200 Syntron units.

• Handles any aggregate.

• One man operation.

• Makes units with 4" variations up to 10' long . . . lintels 4" x 8" or 8" x 8" up to 10' long.

• Overall: 7'6" high . . . 11'6" long . . . 4'0" deep . . . shipping weight 4620 pounds.

PreCaster Inc. • 5217 Beech Street • Cincinnati 17, Ohio

Also available through Jack Ells., 119 Ann Street, Hartford, Conn. . . .
Cline-Thornton, Inc., Glenwood Ave. at 17th & Lehigh Ave., Philadelphia 32 . . .
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COMPLETE PLANTS from a Single Source

• "Tilt-Up" Mixers
• Ready-Mix Plants
• Expressway Semi-Portable Plants
• Dry Batch Plants
• Cement Bins
• Aggregate Bins
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ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

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Weldon White has been named traffic manager and Cliff Bornemann office manager of Fort Worth Sand & Gravel and Texcrete Co. of Fort Worth, Tex., according to a recent announcement made by George A. Meihaus, the company's vice-president. Mr. White will supervise all dispatching and delivery of materials. Mr. Bornemann served as office manager of Texcrete Co., Fort Worth, before the firm combined operations with the present company, one of the Southwest's largest producers.

Trade Notes

L. B. King

North Carolina has been added to the sales territory of L. B. King, Columbia Machine representative in South Carolina, according to Fred Neth, president. Mr. King operates one of nine Columbia Machine sales and service centers located throughout the United States. The home office is in Vancouver, Wash.

Before joining Columbia Machine 2 years ago, Mr. King worked for J. A. Jones Construction Company and the F. C. George Machine Company.

H. Lee Pruett Jr., Worcester, Mass., has been appointed representative for Columbia Machine in the New England territory and upstate New York. Mr. Pruett is a graduate of the University of Missouri with a background in banking and heavy industrial machinery. For a time he headed his own company handling oil well supplies, concrete machinery and allied products.

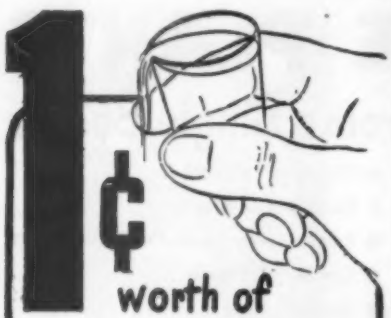
The promotion of Earl C. Sleeman to the post of chief engineer for the Lith-I-Bar Company of Holland, Mich., was announced by Harold Ramsey, general manager. Mr. Sleeman will be in charge of engineering and development on all of the company's products, which include the Lith-I-Block Machine, for making concrete blocks and Lith-I-Bar Concrete Joist Machine, as well as accessory and related concrete handling machinery. Mr. Sleeman joined the Lith-I-Bar Company as a design engineer in 1952. He previously had had wide experience in the design of heavy industrial equipment as a private engineering consultant.

E. C. Sleeman

H. B. Niles

At the same time Harold B. Niles was promoted to the position of service manager; he will be in charge of the activities of the company's force of field service men who are located in various cities throughout the country. Prior to his new assignment Mr. Niles spent five years servicing the company's machines.

Concrete Machinery Division, of the Worthington Corporation, Harrison, N. J., announces the appointment of Concrete Equipment Company, Milwaukee, Wis., as the distributor of Worthington portable mixers, plaster or mortar mixers, building mixers, truck mixers and pneumatic concrete placers, manufactured at their Plainfield, N. J., works for the state of Wisconsin, except for six northwest counties.



1¢ worth of Spray-O-Bond Plasticizer Per Bag

Gives Concrete Units Greater Cohesion Increased Plasticity, Better Texture.

We'll prove it! Send for a free sample of Spray-O-Bond Plasticizer today.

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4 EXCLUSIVE ADVANTAGES AT NO EXTRA COST WITH WAL-LOK

Masonry Wall Reinforcing Mesh

DEFORMED—Gripping qualities are increased 4.6 times over plain wire. In pull-out tests, the 3/16" dia., 100,000 psi. tensile strength longitudinal bars break, under extreme stress, rather than pull out.

KNURLED—150 indentations per foot .002" in depth grip the mortar like thousands of tiny claws. Improves bonding stress 3.2 times over plain wire.

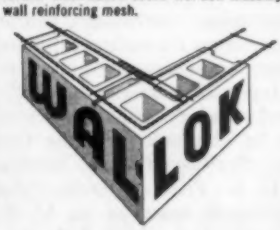
CROSS BARS PROJECT Welded across Stretcher Rods, Cross Bars project for maximum anchorage in mortar. Cross Bars are welded over Stretcher Rods without annealing Stretcher Rods or impairing tensile strength. ***THICKNESS AT THE WELD ONLY 7/32"***

CORROSION RESISTANT
Cross Bars are galvanized for life-long durability but only that section which is exposed.

POSITIVE PROOF
Tests conducted by the Research Foundation of the University of Toledo offer positive proof of these statements. To our knowledge, Wal-Lok is the only masonry Wall reinforcing based on scientific research.

WAL-LOK COMPLIES
Wal-Lok reinforcing now complies with the recommendations of the National Bureau of Standard Bulletin 3079, Requirements for Concrete Masonry Construction (Rev. of NBS Report 2462).

WRITE TODAY for your copy of the Adrian Peerless 4-page folder on Wal-Lok. It contains the data from the Research Foundation tests, specifications, additional advantages and further information about Wal-Lok masonry wall reinforcing mesh.



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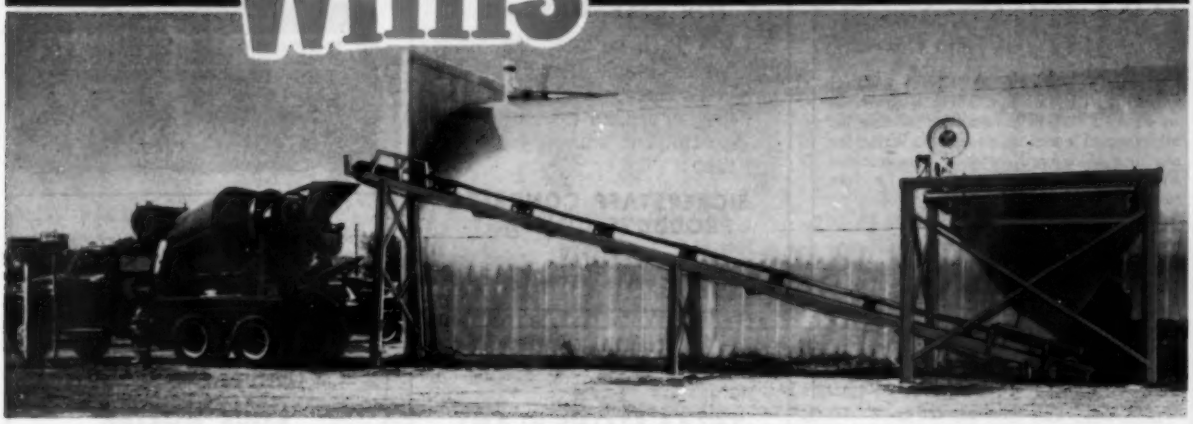
1498 E. Mich. St., Adrian, Mich.

BEAT YOUR ESTIMATES with Willis Portable Batch Plants



Designed for the job and project batching needs of private contractors and municipalities—choice of four sizes to produce up to 60 yards per hour for any size transit mixer. One transit-mix truck, one front-end loader, and a *Willis* portable batch plant put you in business—anywhere.

SPECIFICATIONS:

Gas or electric powered belt conveyor—2 ft. x 40 ft. Neptune water meter and tipple water tank. Hopper frame is held within 8 ft. width for highway transport—4, 5, 6 and 7 yard sizes. Built to last!

PRICES (complete as above, F.O.B. Denver):

Four Yard Size	$5,150
Five Yard Size	$5,250
Six Yard Size	$5,750
Seven Yard Size	$6,350

Small town 20,000 lb. 5-yard batch plant such as this one in Thermopolis, Wyoming, is only $5,250. Note bulk cement shed at the right.

Volume production of 60 yards per hour is possible with this 7-yard batch plant costing only $6,350.

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8x8x16 2 core 1 square end mold box with attach. for steel jamb	$140.00
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A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly — no mixing — no cleanup — no furring — no membranes. Write for technical data—free sample.

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NO. 9 JOLTCRETE EQUIPMENT

Pallets 45% void, 4" code Zorilla, 8" code Damper, 12" code Hearty. 4, 8 and 12" mold boxes. Air off-bearer, spare motors, 110 racks.

APPLEY THREE AT A TIME BLOCK MACHINE with curved cesspool mold box and 4" concrete solid mold box, racks, pallets and air off-bearer.

SMITHTOWN CONCRETE PRODUCTS CORP.
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UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
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FOR SALE—BARGAIN

2—L-5 Lith-I-Block Machines. Three block per cycle and fully automatic. Immediate delivery. Can be seen in operation at our plant. Contact:

BICKERSTAFF CONCRETE PRODUCTS COMPANY
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SUPERINTENDENT FOR TEXAS STONE PLANT

Must have ability to direct plant of thirty men; knowledge of crushed stone operation, production costs, basic plant equipment, heavy machinery maintenance. Starting salary open. Send complete resume of education and experience with references to Post Office Box 482, Dallas, Texas.

WANTED

Manager job for a Ready Mixed Concrete Plant. Can furnish excellent references upon request. 15 years experience.

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One eight inch belt with buckets for elevating gravel fifty four feet high. Also weigh batcher.

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2000 regular metal pallets for Brikcrete machine. All square, clean and in perfect condition. $1.00 each.

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Dunbrick machine, complete with mixer, racks, 4500 or more pallets, etc. New condition. Price $1500.00 FOB Beltsville, Md.

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One skip hoist

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Modern Concrete Block Plant two block Lith-I-Bar Machine, Curing Kiln completely equipped. Suburban Chicago. Minimum price, terms available.

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L-3 Lith-I-Bar Block Machine, 2 block per cycle, fully automatic. 4"—5"—6"—8" and 12" block attachments. 1900—18x18 inch steel pallets. Lots of spare parts, good condition, now running. Reasonable.

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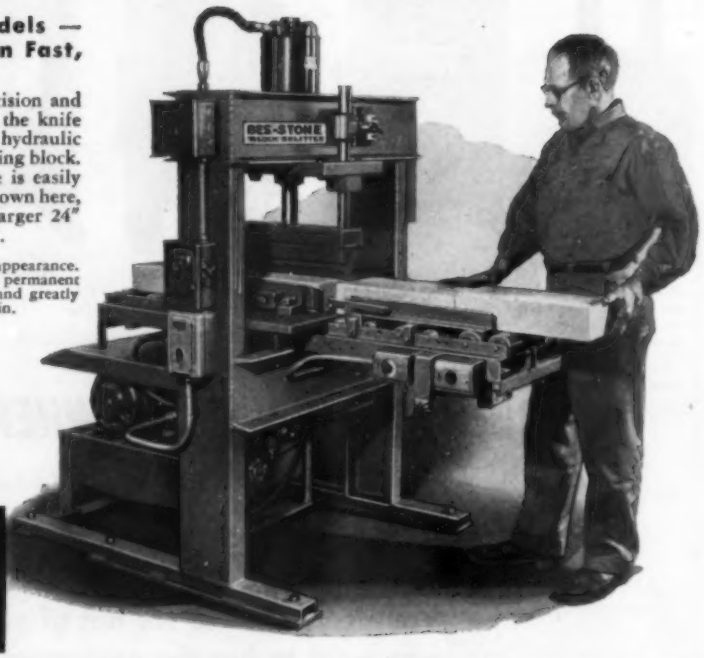
BES-STONE Block Splitter

Made in 2 Sizes — 18" and 24" Models — Produces 960 Split Block per Hour in Fast, Automatic Operation

Splits block in a straight line, with speed and precision and with the utmost safety. The block is placed under the knife automatically . . . the blade descends with a smooth, hydraulic action . . . and the split block is ejected by the incoming block. The operator is always at a safe distance. Machine is easily adjusted for various block heights. The 18" model, shown here, splits block 16" or 18" long, 1⅝" to 8" high. A larger 24" model splits any length up to 24", heights up to 8".

BES-STONE is a new masonry unit with a quarried stone appearance. Can be produced in many sizes and in a series of attractive, permanent colors. No conflict with conventional block. It complements and greatly increases sales of standard stripper block. Write for Bulletin.



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the Split Block with Character

BESSER MFG. CO. • Complete Equipment for Concrete Products Plants • Alpena, Michigan, U.S.A.

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Synthetic Iron Oxide

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INEXPENSIVE - BRILLIANT - CLEAN SHADE

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Your guide to the booming concrete industry
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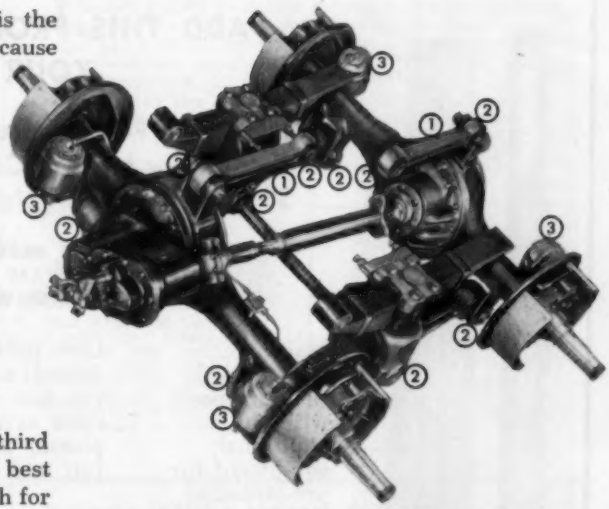
INTERNATIONAL is the most-wanted truck in the heavy-duty field. For the past 22 years, cost-conscious operators have found that INTERNATIONAL quality, dependability and *all-truck* stamina keep operating and maintenance costs to a minimum.

One example of INTERNATIONAL quality leadership is the new rubber-bushed six-wheeler bogie – *most wanted* because it's *most advanced,* with all these new features:

1. New exclusive torque arm design, straddle mounted at axle and frame, for greatly increased strength.
2. New rubber bushings in torque arms, equalizing beams, and radius rods, for reduced shock, longer life, the elimination of 10 lubrication points.
3. New self-contained brake and cylinder unit cuts servicing costs, offers greatly increased protection from damage in off-highway operation.

Plus such time-proved features as the INTERNATIONAL third differential and power divider. The result: world's best 6-wheel buy! Ask your INTERNATIONAL Dealer or Branch for a demonstration, soon.

24 six-wheel models! GVW ratings, 22,000 to 90,000 lbs. Engines from 130 to 356 horsepower. Choice of gasoline or LPG. Diesel engines available in 30,000 lbs. GVW models and over.



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INTERNATIONAL® TRUCKS

"Standard of the Highway"

THE HYDRO-LIFT UNLOADER

Weighs less than fifteen hundred pounds.

Delivers a perfect block—No corners broken.

THE HYDRO-LIFT ON THE JOB

If your truck gets you to the job Hydro-Lift will unload it.

Give us your truck at 7 A.M. and we will return it fully equipped by 7 P.M.

PATENT PENDING.

Positive hydraulic-power driven by engine Power Take Off. Perfect control of load at all times. Unload one lift per minute.

PRICE WITHIN BUDGET OF EVERY MANUFACTURER

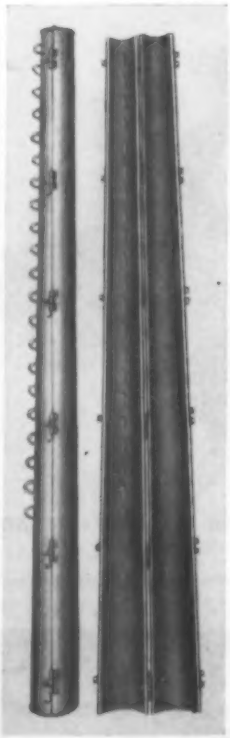
The HYDRO-LIFT

- ✓ Will reduce delivery cost and pay for cost of installation in six months time.
- ✓ Will reduce your truck investment fifty per cent.
- ✓ Will deliver as many blocks as two or three men unloading by hand. DEPENDING ON LENGTH OF HAUL.

Write G & H MACHINE COMPANY

P.O. Box 38 — Columbia, Pa.

BLOCK PLANTS—READY-MIX PLANTS—CONTRACTORS



ADD THIS PROFIT MAKING ITEM TO YOUR PRESENT LINE

This Simple Form Produces Lifetime Concrete Fence Posts
Made of Cold Rolled Sheet Steel
Strong - Durable - Lightweight - Nothing to Wear Out

NO EXPERIENCE NECESSARY — ANYONE CAN OPERATE IT IN THEIR SPARE TIME. THESE POSTS WILL SELL THEMSELVES WHEN PROPERLY DISPLAYED

Makes pre-stressed concrete posts without additional equipment for pre-stressing.

Low initial investment; no additional space required; no power demand; quickly, easily, set up; you can start in production an hour after your form arrives; large market on farms, industrial plants, parks, home owners; kennel operators, fair and amusement parks, raceways, etc.

THE FINISHED PRODUCT

For detailed information write today to:

Manufactured by

CONCRETE POST FORM COMPANY

Cedar Falls, Iowa

To Build Modern . . . *without* Price Penalty . . . Build of Cavitex

Among today's home builders the swing is to masonry. And the ultra-modern masonry is Cavitex. With eye-appeal and price appeal, Cavitex has unusual interest for building contractors and owners alert to modern trends.

Cavitex is new—in size, proportion, design and color range. Cored-out design provides insulation values and saves weight. Easily the most practicable unit for cavity-type wall construction. Ideal also, as veneer over frame, or as facing over 4" concrete block. Available in pastel tones for exposed masonry interior walls.

Expensive? Just the reverse! Material for material, Cavitex costs less than frame. This low price made possible by manufacturing economies. Local plants convert local raw materials into units for local builders. Usual high costs of freight and distribution are practically eliminated. Write today for 4-color brochure and name of nearest plant.

W. E. Dunn Mfg. Co., 420 W. 24th St., Holland, Mich.
CANADA: Dunn Masonry Machinery, Ltd. 862 Dundas H'way, Cooksville, Ont.

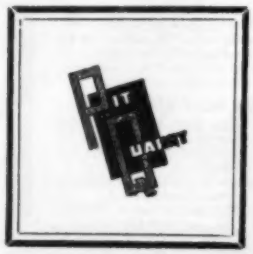
Local Manufacturing Opportunity

Many choice locations are open for the local manufacturing of Cavitex. Excellent opportunity for concrete products manufacturers. Each plant operates under franchise in protected territories. Cavitex machine available on lease or sale. If interested, ask for "Opportunity Unlimited."

X-2

OVER 17,000 POTENTIAL BUYERS

AT YOUR FINGERTIPS



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The meeting place for buyers and sellers

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Get WINTER CONCRETE with HIGH EARLY STRENGTH

by using

SOLVAY CALCIUM CHLORIDE

- **Lowers Costs!**
- **Saves Time Between Operations!**
- **Permits Quicker Finishing!**
- **Cuts Protection Time!**
- **Assures Full Ultimate Strength!**

Today—with SOLVAY Calcium Chloride, it is both possible and practical to carry on concreting operations during the winter months. The addition of SOLVAY Calcium Chloride assures fast setting to permit quick finishing, full ultimate strength and a short protection period—even in freezing weather.

Whether you do your own mixing or use transit-mix concrete, you will be sure of quality work, minimum cost and a faster operation if you are sure that your specifications include: 1. The use of heated water and materials. 2. The use of SOLVAY Calcium Chloride in the mix. 3. The use of proper covering or protection against anticipated temperatures.

Send for FREE BOOK Containing Full Details!

"The Effects of Calcium Chloride on Portland Cement" is filled with important information and answers to your questions about the use of calcium chloride in concrete. Mail coupon below for your free copy.

When ordering READY MIXED CONCRETE IN COLD WEATHER —Be sure to *Specify* SOLVAY Calcium Chloride

Allied Chemical

SOLVAY PROCESS DIVISION
Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

Please send me without obligation your book, "The Effects of Calcium Chloride on Portland Cement."

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Company..... Position.....

Address .....

City..... Zone..... State.....

CM-10

the BAUGHMAN BULK CEMENT TRANSPORT BODY MOVES BULK CEMENT *the fast, modern way!*

Shows patented air cell construction over twin 9" augers which makes starting easier and speeds discharge of cement.

SAVES 3 WAYS

TIME—Quickly loaded through roof hatches. Unloaded by twin auger discharges at a rate of up to a ton a minute!

LABOR—One man can easily handle loading, driving, unloading. Saves labor of bagging and handling bags.

MONEY—Bulk cement costs less than bagged cement.

WRITE for Bulletin A-348. Sales and Service from Coast to Coast.

PORTABLE & STATIONARY TROUGH & SCREW CONVEYORS — BELT & BUCKET ELEVATORS — STORAGE BINS — SELF-UNLOADING TRANSPORT BODIES

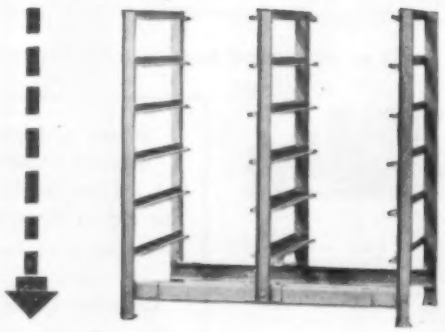
BAUGHMAN

BAUGHMAN MANUFACTURING COMPANY

144 Shipman Road • Jerseyville, Illinois

CHASE BLOCK RACKS, PLAIN STEEL PALLETS

Your best buy

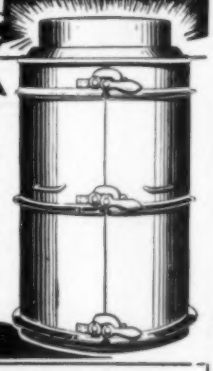


Here's why . . . Standard style or specially designed, Chase racks meet your requirements. They're shipped painted and knocked down—assembly is easy—no special tools or welding needed. Chase experience means low prices and years of dependable service. Check Chase prices.

Chase FOUNDRY & MANUFACTURING CO.
3200 PARSONS AVENUE • COLUMBUS 7, OHIO

FOR THE FINEST CONCRETE PIPE... YOU NEED FINEST FORMS!

THE *Quinn Standard*



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

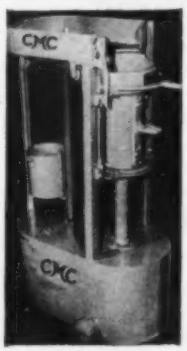
• **QUINN HEAVY DUTY PIPE FORMS**

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired.

***WRITE TODAY** for complete information and estimates.*

Also manufacturers of QUINN CONCRETE PIPE MACHINES

Quinn WIRE & IRON WORKS
BOONE, IOWA



Here's Your Big Money Maker!

One machine to make drain tile in all the popular sizes. **TURN CONCRETE INTO GOLD SHECKLES** with the **MARVEL 8.**

- Modest Investment
- Low Operating Expense
- All year demand for **MARVEL TILE**

Bulletin and facts sheet upon request. Write today!

Concrete Machinery Company
Hickory 21, North Carolina

The World's Largest Manufacturer of Aluminum Molds for Concrete Yard and Garden Ornaments.

The KEY to ECONOMY IN BLOCK PRODUCTION

OSWALT SERVICE

boosts the capacity and efficiency of your Vibrapac machine . . . and enables you to produce a far greater daily output without sacrifice of block quality.

Only OSWALT Service gives you this combination of time-proved advantages:

1. Improved Vibration and Machine Changes for higher speeds and more production.
2. Simplified Height and Density Control for uniform, accurate size blocks.
3. Shock-Free Block Ejector and Front-End Pallet Feeder (shown at right) for reducing green cracking and making better blocks with a minimum of culls.

For details of this economical method of block production . . . write for New OSWALT Bulletin.

New Heavy Duty Type of
OSWALT Block Ejector and Pallet Feeder

OSWALT ENGINEERING SERVICE CORP.

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FOR HANDLING CONCRETE AND CERAMIC PRODUCTS YOU NEED

TRIPL-PALM

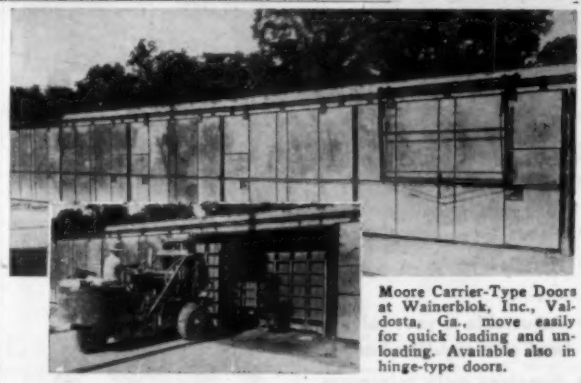
NO SEAM HERE
The wing thumb construction multiplies glove life.

TOUGHEST WHERE WEAR IS ROUGHEST

Putting the wear in gloves at the right point really helps reduce glove costs and with Tripl-Palm you get an added cushion for hand comfort. Tripl-Palms are available in knit wrist, and gauntlet styles and coated or "free-breathing" backs. At your Jobber or write for information.

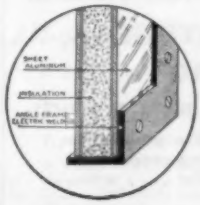
THE SURETY RUBBER CO.
CARROLLTON, OHIO

In Canada, Safety Supply Co., Toronto



Moore Carrier-Type Doors at Wainerblok, Inc., Valdosta, Ga., move easily for quick loading and unloading. Available also in hinge-type doors.

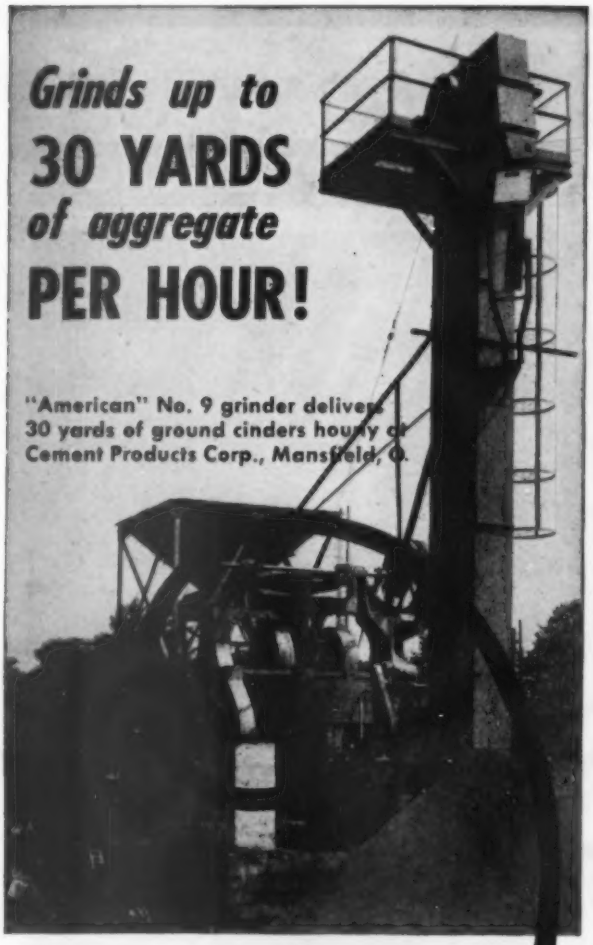
Moore Metal-Insulated Kiln Doors Save Fuel—Reduce Curing Time



Keep heat where it belongs—inside the kiln—with Moore Aluminum-Insulated Doors. They improve curing conditions—save steam—last longer.

Send us dimensions of present door openings for quotation.

MOORE DRY KILN COMPANY
Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers
JACKSONVILLE, FLORIDA · BRAMPTON, ONT. CANADA · VANCOUVER, B.C. CANADA · NORTH PORTLAND, OREGON

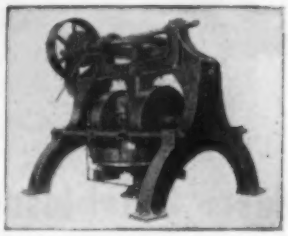


Grinds up to 30 YARDS *of aggregate* PER HOUR!

"American" No. 9 grinder delivers 30 yards of ground cinders hourly at Cement Products Corp., Mansfield, O.

HERE'S WHY AN *American* GRINDER IS THE *RIGHT* GRINDER FOR YOUR PLANT . . .

- Needs no screen plates
- Handles material wet or dry
- Adjustable to your volume and size requirements
- Requires only minimum maintenance
- Has low power consumption
- Good for years of trouble-free operation



YOU CAN'T BEAT AN "AMERICAN" FOR GRINDING

- CINDERS
- HAYDITE
- PUMICE
- SLAG

and a wide range of quarry and mine products.

If accurate grinding, in volume, poses a problem in your plant . . . ask for a non-obligating consultation with the "American" grinding specialist . . . write, wire or phone.

American GRINDERS

W. A. RIDDELL CORP., BUCYRUS, OHIO

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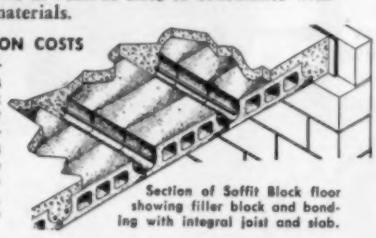
"I Find BOTH Profitable"

VIBRAPAC Block and SOFFIT Floor and Roof Filler Block

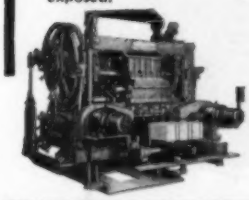
Vibrapac block plants are now adding to their profits by manufacturing Soffit Filler Block for floors and roofs. These units assure permanent, fire-safe construction, at low cost. Soffit Block provide maximum acoustical and insulation values with natural base for radiant heat installations. Made in various sizes to coordinate with other modular materials.

CUTS CONSTRUCTION COSTS

Temporary adjustable steel centers support Filler Block while slab and joist are curing. Conventional shoring is eliminated. The smooth, flush surface can be plastered, painted or left exposed.



Section of Soffit Block floor showing filler block and bonding with integral joist and slab.

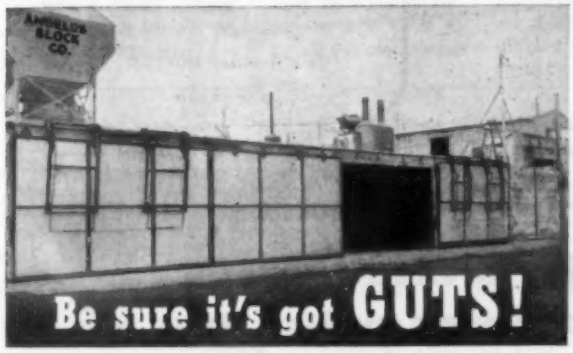


BESSER VIBRAPAC

Vibrapac Block for walls, floors and roofs, in all styles and sizes, are made on a Besser Vibrapac, using one set of Plain Pallets. Fully automatic. No machine operator required. Write for descriptive literature.

BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants

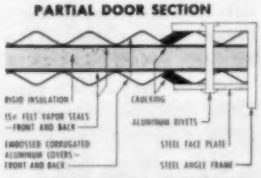
A 7015-¼



Above: Universal Doors and Carriers in use at Angelus Block Co., Burbank, Calif., one of the West's oldest and largest block producers.

Kiln closure equipment is no place for tin-pan construction. Be sure the equipment *you* buy has the *guts* to give you efficient operation and long trouble-free service. Write, wire, or phone for detailed information.

PARTIAL DOOR SECTION

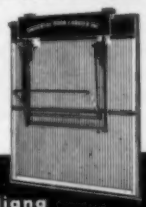


All welded and riveted assembly. Complete internal drainage system for condensation.

Universal

KILN DOORS and DOOR CARRIERS

50th Anniversary 1904-1954



UNIVERSAL DOOR CARRIER, INC.
1117 Cornell Ave., Indianapolis 2, Indiana
"SPECIALISTS IN KILN CLOSURE EQUIPMENT—SINCE 1904"

3 typical Cases

Case No. 426: Stripping and loading concrete block. Job-fitted coated gloves wore 7 days vs 3 days for leather gloves.

Case No. 137: Outwore heavy canvas 4 to 1, handling block, sand, cement.

Case No. 314: Handling concrete pipe. 28 to 30 hours wear vs 2 to 3 hours with nap-out double palm gloves.

Job-fitted to cut glove costs

No. 304
Double coated palm

Edmont

Edmont JOB-FITTED GLOVES

If your men are wearing canvas, leather or ordinary plastic work gloves, we can show you substantial cost-savings. Our Monkey-Grip plastic coated gloves are job-fitted for handling concrete products. They include double-thick palm styles that handle as many as 29,000 block per pair.

Free Offer to Employers

Tell us the materials you handle. Without cost we will recommend and send test samples of the glove that best fits the job.

Edmont Manufacturing Co.
1208 Walnut St., Coshocton, Ohio

CARPENTER Equipment LEADS

for profitable production of SEPTIC TANKS

Make quality units the CARPENTER way — it's fast, economical, and employed by satisfied customers from coast to coast. One man handles our delivery rig.

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Phone 28938 — Box 470 — Richmond, Virginia

JOHNSON ELEVATOR CHAINS

- long-life carburized steel knuckles
- medium-high carbon steel side bars
- alloy heat-treated ⅜" pins
- welded bucket lugs

All-welded BUCKETS

- light, durable, smooth
- fill fast, clean fast
- heavy gauge lips, ends
- cement: 10x6, 12x7, 14x7"
- agg.: 10x6, 12x8, 14x8, 16x8"

to: C. S. JOHNSON CO. Champaign, Illinois
Send information on: ☐ buckets ☐ elevator chains
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STREET .....
CITY, STATE .....
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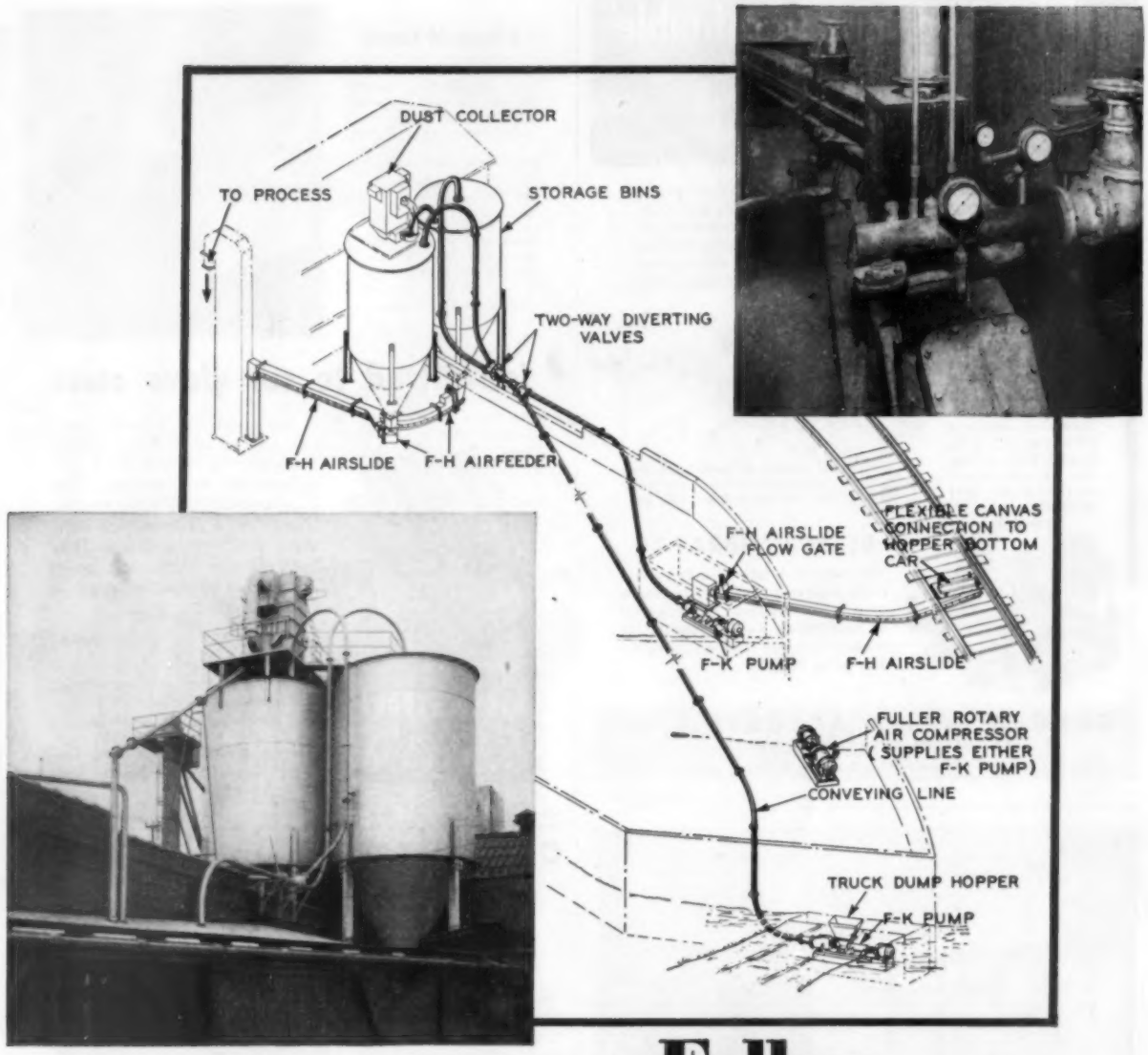

Certain-teed makes certain with **Fuller**

... Unloading and conveying system pays off

A few years ago, Certain-teed Products Corporation decided to find, if possible, more economical methods of operation in its York, Pa. plant. One problem given serious consideration was the handling of incoming limestone and slate filler dust received in bags, requiring costly, manual labor, resulting in breakage of bags with consequent loss of material and a dusty condition in the plant.

Together, Certain-teed and Fuller engineers made studies of their layout and came up with a solution—a combination of the Fuller-Kinyon Conveying System and F-H Airslides.

Two Fuller-Kinyon Pumps are used. One conveys limestone dust from hopper-bottom cars, utilizing the Airslide to convey from cars to the pump located in a pit in the plant. This pump conveys to either one of the two storage bins . . . efficient, clean, rapid transfer from cars to storage. The other pump handles the slate dust, delivered in trucks, also conveying to storage. Withdrawal of either material from storage bins is accomplished with Airslides, which discharge to an elevator delivering to process.

Air for the pumps is supplied by a Fuller Rotary Single-stage Compressor, having a capacity of 482 c.f.m. at 20-lb. pressure. Low-pressure air, for the Airslides, is supplied by a small blower.

It is reported that the savings realized by the use of this Fuller system has paid for the installation in less than two years of operation.

Possibly your materials handling is antiquated and costly, which could be remedied by a comparatively small investment. Why not find out . . . have a Fuller engineer study your operation and submit a report . . . it will cost you nothing, nor obligate you in any way.

FULLER COMPANY
Catasauqua, Pa.

Branch offices: Chicago—San Francisco—Los Angeles—Seattle—Birmingham

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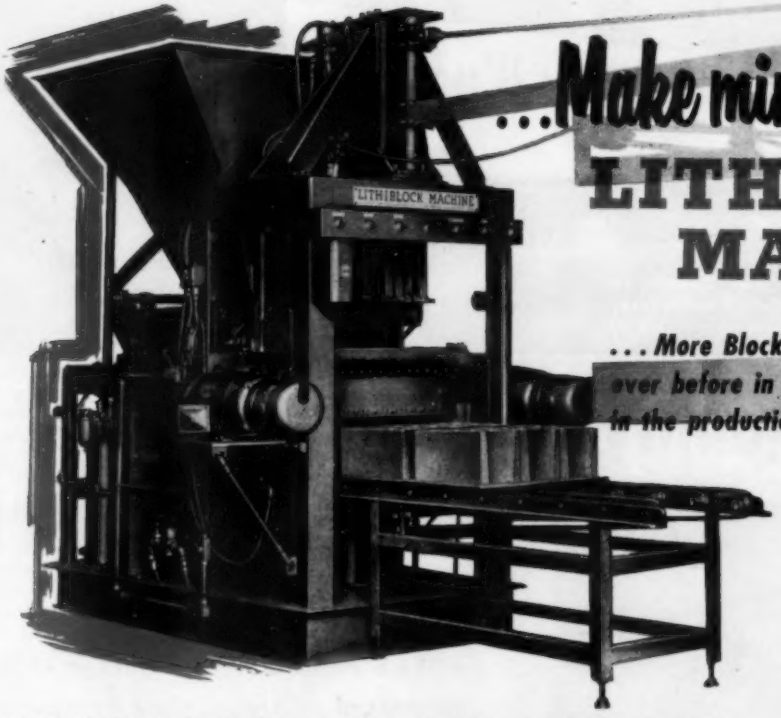
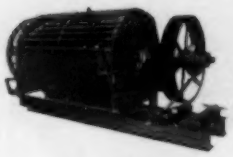
DRY MATERIAL CONVEYING SYSTEMS AND COOLERS . . . . PREHEATERS . . . . COMPRESSORS AND VACUUM PUMPS . . . . FEEDERS



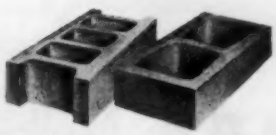
...Make mine a LITH-I-BLOCK MACHINE

...More Block Producers said that in July than ever before in the Company's history of 25 years in the production of concrete products machinery.

LITH-I-SKIP Self-Supporting Skip Hoist



LITH-I-MIXER with NiHard Liners and Blades



Make the popular 4" high block as well as all standard sizes on the Lith-I-Block Machine.

LOW INITIAL COST AND HIGH QUALITY OF OUTPUT PLUS FEATURES LIKE THESE MAKE LITH-I-BLOCK YOUR BEST VALUE

4-POINT HEIGHT CONTROL INSURES TOP AND BOTTOM SURFACES PARALLEL	TAMP OR PRESS OR DO BOTH IN SAME CYCLE TO ASSURE UNIFORM TEXTURE	QUICK-CHANGE MOLD BOX INCLUDING STRIPPERS CHANGED IN LESS THAN TWENTY MINUTES	4-5 CYCLES PER MINUTE WITH SAND & GRAVEL. MORE WITH LIGHT AGGREGATE
STANDARD PLAIN STEEL PALLETS FIT ALL TYPES AND SIZES OF BLOCK	POSITIVE ELECTRONIC TIMING OF FEED DRAWER AND STRIPPING ACTION	FULLY AUTOMATIC, SEMI-AUTOMATIC OR MANUAL OPERATION	AVAILABLE IN TWO SIZES L-5 3-BLOCKS OR L-3 2-BLOCKS PER CYCLE

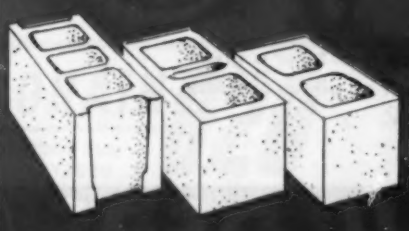
Block Producers today must meet ever more exacting requirements—specifications held to closer tolerances, quality controls set to higher standards. Only with equipment of the best engineering design can these demands be efficiently met. A continuing program of research and development enables Lith-I-Bar to supply you with the machinery and know-how to keep you ahead of the field.

SALES AND SERVICE THE WORLD OVER

SAVES YOU MONEY TO BEGIN WITH—EARNS YOU MOST IN THE LONG RUN

LITH-I-BLOCK MACHINE

A Product of THE LITH-I-BAR COMPANY HOLLAND, MICHIGAN



WRITE TODAY FOR COMPLETE DETAILS ON LITH-I-BLOCK MACHINE

LITH-I-BAR CO. HOLLAND, MICH.

Please send full information on LITH-I-BLOCK MACHINE

Firm Name_____

Individual_____ Position_____

Address_____ Phone_____

City & State_____

Sears Roebuck Store, Compton, California. Architect—Stiles Clements, Los Angeles, Calif.; Contractor—L. E. Dixon Co., San Gabriel, Calif. Pozzolith Ready-Mixed Concrete supplied by S. H. Bacon Materials Co., Huntington Park, Calif.

better quality concrete here with POZZOLITH*

Cooper's Department Store, Fresno, California. Architect—Leo Roselyn Co., San Francisco, Calif.; Contractor—Harris Construction Co., Fresno, Calif. Pozzolith Ready-Mixed Concrete supplied by Stewart & Nuss, Inc., Fresno, Calif.

Jacobson's Store, Birmingham, Michigan. Architect—Arthur O. A. Schmidt, Detroit, Mich.; Contractor—E. J. Swink, Birmingham, Mich. Pozzolith Ready-Mixed Concrete supplied by Boice Builders & Supply Co., Pontiac, Mich.

- These stores are representative of many commercial structures where Pozzolith was employed to produce better quality concrete.

The most important basic factor affecting the quality of concrete is the *unit water content* (water required per cubic yard of concrete). See Bureau of Reclamation's current Concrete Manual, Page 130.

Pozzolith, through dispersion of cement, is the key to producing *lowest unit water content*. Thereby it insures reduced shrinkage, low permeability, increased bond to steel and long life.

Investigate the advantages of Pozzolith for your next job . . . it will enable you to obtain the required concrete qualities at lower cost than by any other means.

Full information on Pozzolith and "see-for-yourself" demonstration kit supplied on request.

*** POZZOLITH . . . reduces unit water content up to 15% for a given placeability, makes available the optimum amount of air in concrete and fully complies with the water-cement ratio law.**

The MASTER BUILDERS Co

CLEVELAND 3, OHIO • TORONTO, ONT. — Subsidiary of American-Marietta Company — Cable Address, Mastermethod, New York

Some Day... Maybe NOW...

You'll want these 2 yd. SHOVEL advantages!

When you need a 2-yard shovel, make sure the one you buy is a wise and sound investment. You'll be putting out important money for a machine that should make you money for years to come. Be sure you get the best. The Lorain-820 is a great 2-yard shovel, loaded with design features that mean easy operation, long life and more dirt or rock loaded at less over-all cost. The "820" is built to precision standards, quality is controlled every step of the way, performance is tested and proved. When the day comes for your big 2-yard shovel, remember all the things you get in a Lorain-820. Your nearby Thew-Lorain Distributor can show you why they mean more money in your pocket!

THE THEW SHOVEL CO., Lorain, Ohio

HERE ARE A FEW OF THE BIG VALUES IN THE LORAIN-820 . . .

☆ Center Drive concentration of engine power ☆ No-stall, non-shock Hydraulic Coupling power take-off ☆ Heavy, close-coupled design ☆ Self-equalizing Turntable rollers, mounted on roller bearings ☆ Hoist Drums on anti-friction bearings ☆ Internal expanding clutches with booster bands ☆ Hoist Drums may be "backed-down" ☆ 2-piece hoist brakes ☆ Interchangeable 2-piece laggings ☆ Swing Drums on anti-friction bearings ☆ Heat-treated, alloy steel gears ☆ Clutch linings precision surface ground ☆ Nickel cast iron clutch friction rings ☆ Air controls for crawler steering, for travel jaw clutch, for tread locking pawls, for crowd jaw clutch ☆ Air-assist on crowd and retract clutches for crowd, retract, crawler travel, boom derricking and lowering ☆ Independent crawler travel for simultaneous hoist, swing and travel ☆ 2-speed travel in both directions ☆ 4-way Tread-Travel lock ☆ Heat-treated, drop-forged treads ☆ Precision drilled tread-pin holes ☆ Heat-treated driving lugs and roller path ☆ Crawler 15 ft. 6 in. long x 11 ft. 4 in. wide ☆ 34 in. treads provide 10,930 sq. in. ground bearing area ☆ Positive, independent chain crowd ☆ Heavy, cross-braced, all-steel, all-welded shovel boom ☆ All-steel, all-welded dipper stick ☆ Drop-forged, heat-treated rack sections ☆ Spring-mounted "Green Horn" ☆ Adjustable, replaceable wearing strips in Shipper Shaft sleeve ☆ Power dipper trip ☆ Fully convertible from shovel to dragline, clamshell, crane or hoe, with many additional special features for these specific applications ☆ Diesel engine-powered ☆ Also available on rubber-tire Moto-Crane mounting.

SAVE THIS PAGE ★ CHECK THESE VALUES WHEN YOU BUY!

THEW LORAIN®

OFFERING MORE THAN 136 SHOVEL-CRANE COMBINATIONS ON CRAWLERS OR RUBBER-TIRES ... TO BEST FIT YOUR JOB FOR PROFIT!

LORAIN 820

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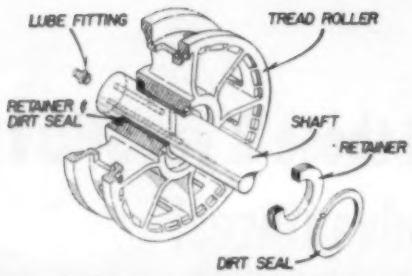
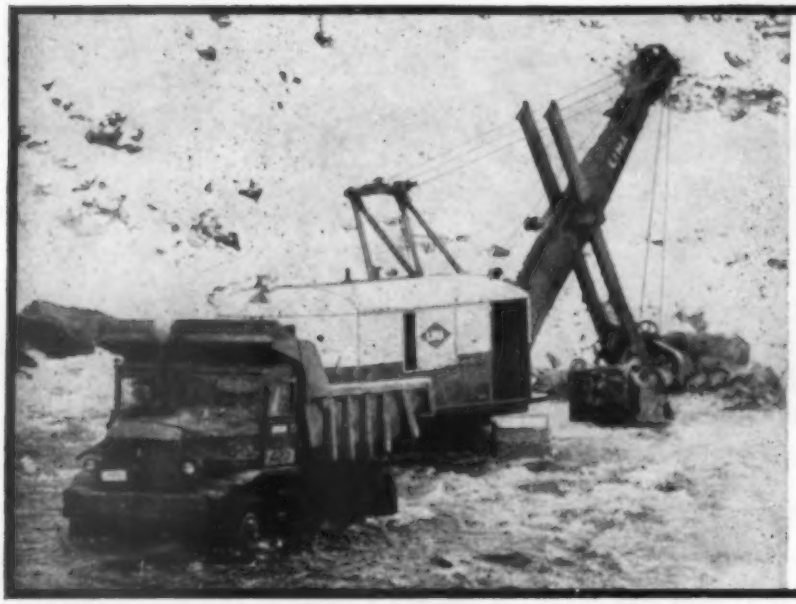


LIMA DIRT SEALS CUT DOWN-TIME AND MAINTENANCE COSTS



This LIMA shovel, demonstrates the importance of LIMA'S dirt seals and grease retainers.

In such work, abrasive material which wears out the bushings and shafts of ordinary shovels is excluded. LIMA seals the lubricant in and dirt out, thereby reducing friction and prolonging the life of bushing, roller and shaft.

COMPARE! No other machine gives you as much as LIMA!

1. Bronze bushings in tread, idler and drive rollers are protected by piston-type dirt seal rings and retainers.
2. All gears, smaller parts and shafts which are subject to extra wear are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation to eliminate excess counterweight.
4. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
5. Big capacity drums and sheaves lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
6. Full air controls on travel, hoist, swing and boom hoist, result in smoother, more precise operation, minimum maintenance and less operator fatigue.
7. Torque converter (optional) automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (¾ yd. to 6 yds.), cranes (to 110 tons) and draglines (variable).

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

LIMA
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS

BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

QUESTION*

How much more material is there in a Three-Inch-Higher Windrow . . . 9% . . . 18% . . . 31% . . . ?

Cross section of an average, 21-inch high windrow . . . the area (width x height ÷ 2) is 614 sq in.

Now increase the height of the windrow by 3 in. The cross-section area now equals 804 sq in.

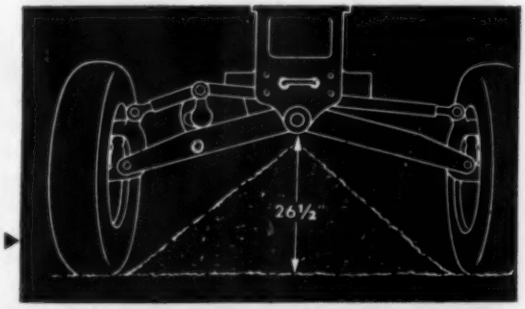
The difference: 190 sq in, over 30 percent more area, meaning over 30 percent more yardage.

---

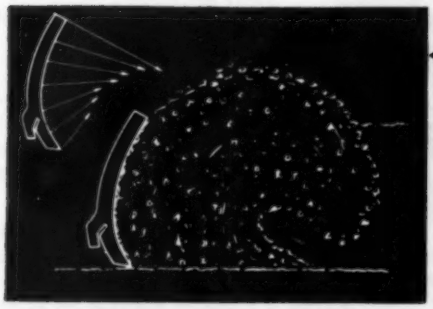
*Only a Combination of Advanced Design Features Lets a Motor Grader Handle Big Loads Fast

To take full advantage of even a *three-inch* difference in windrow height (as explained above) a heavy-duty motor grader needs new design and performance characteristics from front to rear and top to bottom.

Let's analyze the Allis-Chalmers 104-brake-horsepower AD-40 to see how it measures up to these stiff requirements.

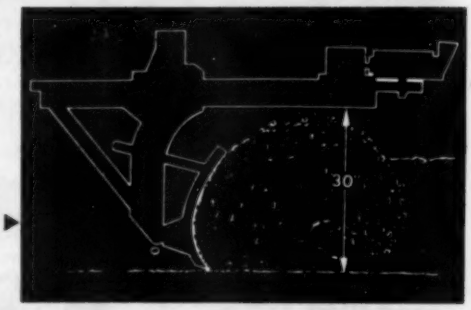


1 **A HIGH-ARCH FRONT AXLE** to straddle big windrows . . . take advantage of that three-inch difference and let big loads pass through to the blade.



2 **A ROLLING-ACTION MOLDBOARD** . . . to insure a "live" load that rolls freely off the blade . . . moves the load faster and takes full advantage of engine power.

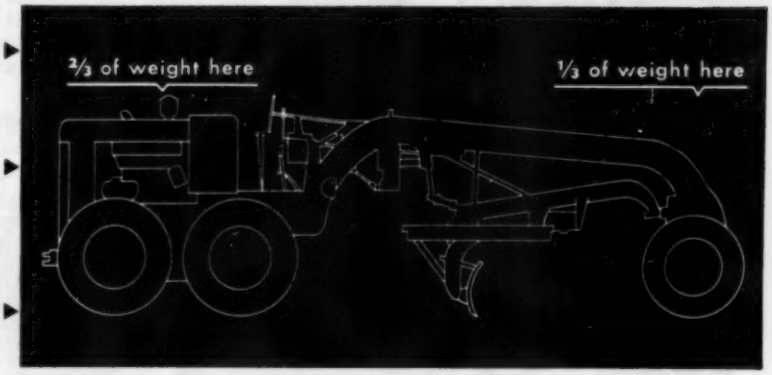
3 **AMPLE THROAT CLEARANCE** . . . to handle 30 percent bigger loads without disturbing free, rolling action . . . and without jamming dirt, oil-mix or any other material against the circle.



4 **FULL BLADE FREEDOM** . . . the exclusive tubular frame and a long tubular drawbar insure full blading effectiveness on the road, in the ditch or on the slope.

5 **BALANCED POWER, WEIGHT AND TRACTION** . . . a heavy-duty engine and *two-thirds* of the weight concentrated on tandem-drive rear wheels provide the best in traction, positive blade pressure and steer-ability.

6 **EASY CONTROL AND VISIBILITY** — A big platform with plenty of leg room, adjustable seat and steering wheel, power steering, assures working ease. Single member frame, low control board and tapered platform corners provide "pilot-house" visibility.



Your Allis-Chalmers dealer will be glad to show you how the AD-40 gives you the *differences* that mean more work done . . . by a demonstration under on-the-job conditions.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

If you use filter systems...

CHECK THESE MULTIPLE ADVANTAGES OF THE REVOLUTIONARY Dualaire* New DUST COLLECTOR!

No pressure surges!
No filter choking!
Efficiencies up to 99.99%!

Why The DUALAIRE Is Better!

Here's the heart of the DUALAIRE principle. Gas enters through top of filter tube (A). Dust is filtered out along length of filter surface and as it begins to build up (B), the slight change in differential pressure causes the reverse-jet blow ring to go into operation. This ring fits tightly around the filter tube and concentrates a jet of air (C) that blows from the outside inwardly through the filter fabric (D).

As the ring moves up and down the tube, the fabric is flexed and blown at the same time, thus loosening the dust *in small portions*. The blow ring travels up and down the filter tube until the filter is clean, then automatically stops until the tube again requires cleaning.

Cleaning action is uniform and steady. There are no sudden pressure surges as filter surface is cleaned — no destructive rapping or jarring operations to shorten life of filter element — no wide variations in gas flow or plant efficiency!

If you use bag-houses or other similar collecting systems in your plant operations, be sure to investigate the *many* vital advantages built into Western Precipitation's new DUALAIRE Dust Collectors. Backed by the same well-known organization that pioneered commercial application of COTTRELL Electrical Precipitators and MULTICLONE Mechanical Collectors, DUALAIRES bring entirely new performance and efficiency standards to filter-type collection systems.

As outlined at the left, heart of the DUALAIRE is a reverse-jet blow ring that travels up and down the cloth filter tube, keeping it clean without the alternate choking and pressure surges characteristic of conventional rapping, vibrating, or jarring systems of cleaning off the collected dust. *Result*—

▸ **UNIFORMLY LOW PRESSURE DROP** is assured, because the collected dust is removed steadily and in small increments — not by sudden surges!

▸ **UNIFORMLY HIGH EFFICIENCIES** — as high as 99.99% under actual field conditions — are maintained by the constantly-cleaned filter surfaces. There is no "choking" action — no variation in filter efficiency as dust accumulates!

▸ **LONGER FILTER LIFE** is obtained because the filter fabric is not subjected to destructive jarring, rapping and vibration of conventional filter cleaning methods. The Dualaire cleaning action is gentle — yet far more effective!

▸ **LESS EQUIPMENT IS REQUIRED** to handle a given capacity with the Dualaire because no standby sections need be provided for gas cleaning while other sections are shut off for rapping. The Dualaire filter is kept constantly clean — automatically — while it is filtering out the suspensions. The gas is filtered and the dust removed simultaneously — without interruption. Saves space, simplifies installation!

▸ **MAXIMUM ADAPTABILITY** to varying installation requirements is assured by the "sectionalized" design of the Dualaire. Each section is available in 5 different heights — and as many sections can be bolted together as desired to meet plant requirements. As needs increase, simply add more sections!

▸ **EFFICIENT STRAIGHT-THRU DESIGN** of filter tubes assures easier dust recovery, better flow. Dirty gas enters top of tube, is filtered through the walls, and dust drops by gravity through bottom of tube into collection chamber. Separated material does not re-entrain in the gas flow.

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There are many other advantages built into the DUALAIRE. *For further details send for this descriptive 12 page booklet. Or contact your nearest Western Precipitation representative!*

*"Dualaire" & "Multiclone" ®

Licensed by H. J. Hersey, Jr.

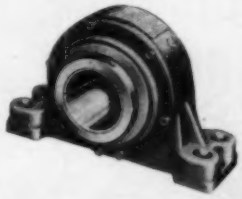
TAPER-LOCK SOLID STEEL CONVEYOR PULLEY

1. *DRUM DESIGN*
— maximum strength
— minimum weight

2. *FULLY ENCLOSED*
no dust — no dirt — no water

3. *SUBMERGED-ARC PROCESS*
— full strength in all welds

4. *TAPER-LOCK BUSHING*
— no walking on shaft
— easy on — easy off!

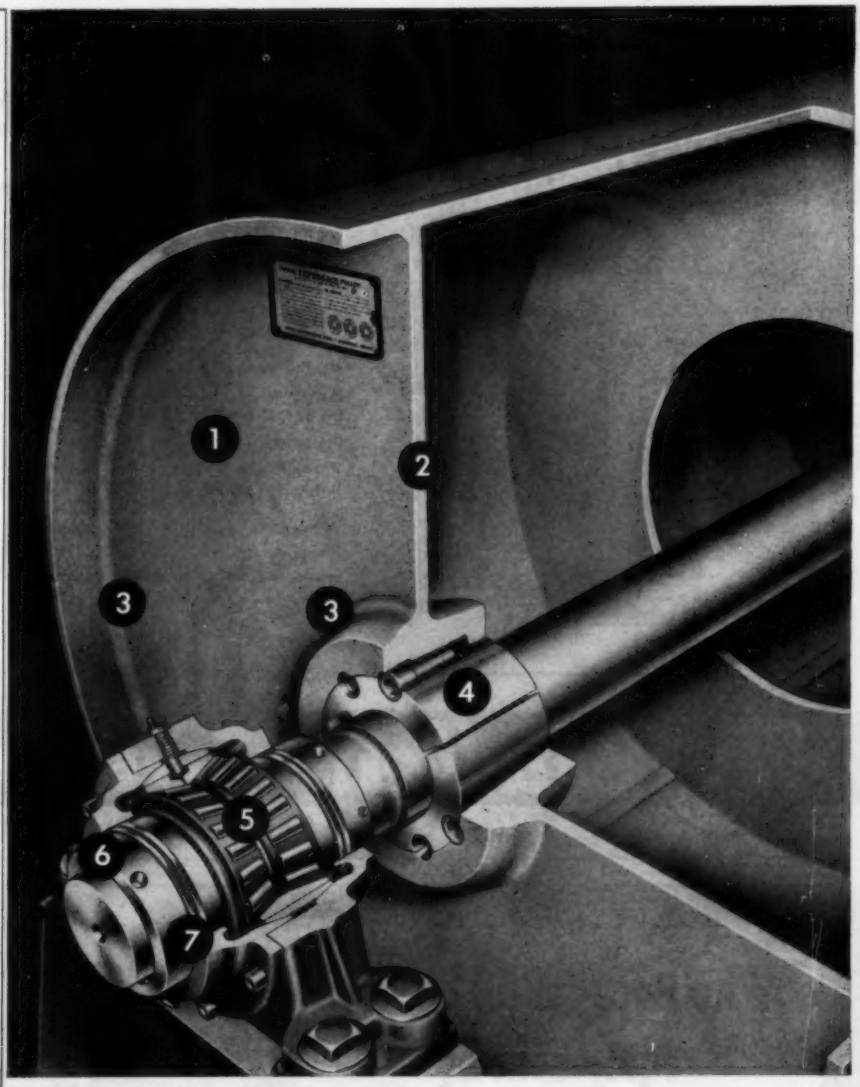


DODGE-TIMKEN ALL-STEEL PILLOW BLOCK

5. *NEW HEAVY-DUTY TIMKEN ROLLER BEARINGS*
— fully self-aligning

6. *HEAVY-DUTY ADAPTER MOUNTING*

7. *Sealed both on and off the shaft with DOUBLE PISTON RINGS*



Here's a heavy-duty combination for tough conveyor jobs!

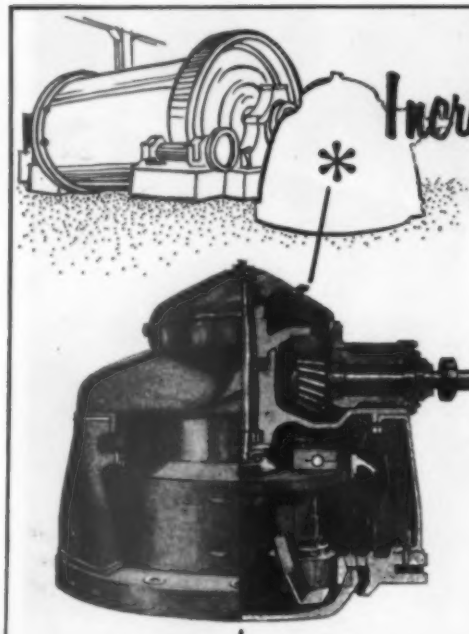
Pulleys from 6 in. to 8 ft. in diameter, all face widths. Bearings from 2 1⅞" to 10" bores. Popular sizes stocked by our Distributors. Write for detailed information.

DODGE

of Mishawaka, Ind.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE MANUFACTURING CORPORATION, 4000 UNION STREET, MISHAWAKA, INDIANA



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Automatic electrical feed control eliminates manual operation. Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum.

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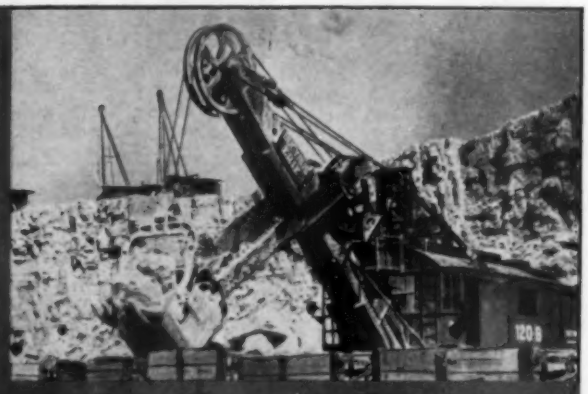
Wire Rope for all quarry equipment by

Macwhyte



You'll save money by using Monarch Whyte Strand Wire Rope specially designed to give long, safe, low-cost service on your quarry equipment.

Monarch Whyte Strand wire ropes are PREformed and internally lubricated. For best service, all wires are coated with special lubricant to reduce corrosion and internal friction.

There are a thousand and one ropes made by Macwhyte.

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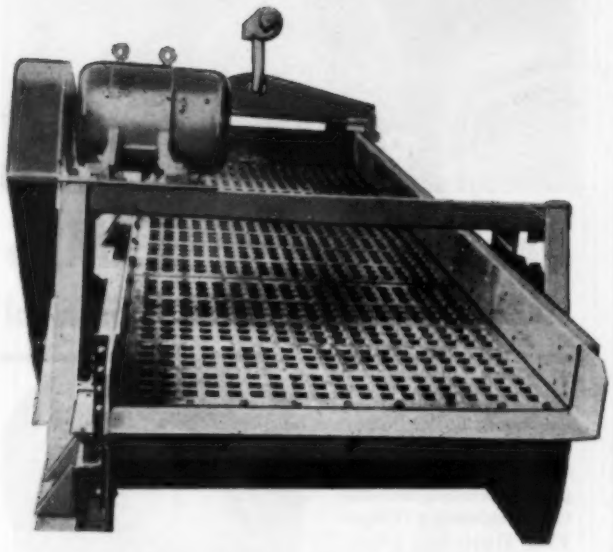
1001

Takes Rough Treatment In Its Stride



Hendrick Perforated Metal Plate takes the knocks and bruises of constant heavy-duty screening without altering uniformity of material. Because the holes can not stretch, Hendrick Perforated Plate assures large quantity screening without expensive, time-wasting blinding. And decks can be changed quick-as-a-wink! Supplied either flat or corrugated, Hendrick Perforated Metal is available in any desired shape and size of openings in high carbon, stainless steels and in other commercially rolled metals.

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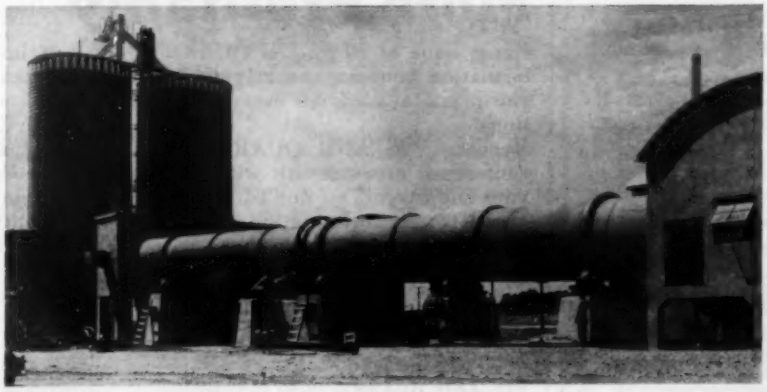

Here are two Kilns 8′ diameter x 125′ long at the Buildex, Inc. plant, Ottawa, Kansas, used for making Light Weight Aggregate. They also have two Rotary Coolers 5′ x 6″ diameter x 50′ long, that work with the Kilns.

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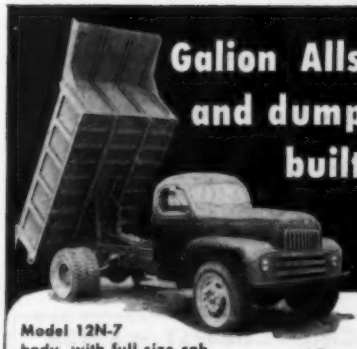

Galion Allsteel hoists and dump bodies are built especially for you!

Model 12N-7 body, with full size cab protector, carries 10 yd. loads.

The facts prove why!

• ***Dump body durability*** for any type of hauling year after year—that's what you get in today's standard Galion dump body. If you want built-in ruggedness—if you want improved tail gate operation and a new body design that is engineered to last longer—then you should buy a new standard Galion dump body.

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Plenty of lifting power. Galion carries a complete line of hydraulic hoists... 3 to 27 ton lifting capacities. Every hoist engineered with a safety factor—every hoist factory pretested and ready to work. Galion hoists with Fulcrumatic lift action give you smoother, steadier dumping cycles ... will work longer and need little or no maintenance.

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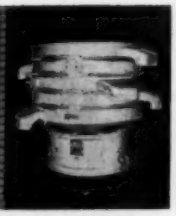
SCREENING NEWS



Helpful information on screening and separating operations ...from field reports of **SWECO SEPARATOR** *District Engineers*

Crystal Silica Ups Industry Average for Efficiency

Crystal Silica Company, Oceanside, California, upholds a quarter-century reputation for producing accurately sized grades of silica sand. Using a battery of multi-decked SWECO Separators, they turn out five different grades from minus-10 to minus-60 with 98% accuracy—compared with accepted industry standards of about 85%. SWECO installations have stepped up Crystal's screening capacity 50% in past two years. Average life of stainless steel screens is 200 days on a 24-hour, 7-day production schedule.

Barium Ore Processor Finds Double Job for Sweco

Versatility of SWECO Separators is attested by Barium Products, Ltd., Modesto, Calif., which uses the same 48" single-deck unit for dual purpose: to screen barium oxide grinding material (plus 40 mesh desired) and lamp black (minus 20 mesh desired). Changing screens, adding decks, adjusting eccentric weights give processors the flexibility they desire with SWECO.

At another processing stage, same company uses a two-deck SWECO Separator to screen 180-lb.-per-cubic-foot barite ore at throughput rate of 10 TPH at minus-10 mesh.

SWECO Engineer Reports Test on Nepheline Syenite

After testing samples of Nepheline Syenite for a Canadian client, SWECO engineer summarized: "One 48" SWECO Separator will have ample capacity to handle two tons per hour of this material on either 94 mesh or 100 mesh screen cloths. Believe two ton per hour could also be achieved on 165 mesh. If small percentage of fines can be permitted to move off screen with the oversize, capacity can be greatly increased."

Free screening analysis and recommendations . . .

SWECO *District Engineers are available to make detailed analyses and recommendations on specialized screening operations without cost to you.*

SEND FOR BULLETIN # 4-6

Detailed information on applications of SWECO *Screen Separators.*

SWECO SEPARATORS

SOUTHWESTERN ENGINEERING COMPANY

4800 Santa Fe Ave., Los Angeles 58

LOgan 8-6262—Cable: SWECOLA

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Graduate engineer qualified as superintendent for gas-fires vertical kiln lime plant. Must be willing to assume responsibility and capable of developing into company production manager. Should be interested in future development rather than starting salary. Job offers plenty of hard work but wonderful opportunity for the right man.

Reply giving age, education, experience and salary required. Full details in first letter. All replies maintained confidential.

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BOX NO. M-123, c/o
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Bin Unit with 8'x18' 2-compartment bins and 48"x12' triple-deck screen with spray bars
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All necessary conveyors and electric motors
Caterpillar D364 Electric Set
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I.R.40 Sharpner complete with IR40-1494 Access. also 24"x38" Ding's Magnetic Pulley.

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1000	*Westg.	CW	250
700	*Al.-Ch.	ANY	720
600	G. E.	MT-567	1800
600	*Westg.	CW	450
600	*G. E.	I-P	257
500	Westg.	CW	350
400	Al.-Ch.	3 beg.	450
400	*G. E.	MT-412	450
300	*G. E.	IE-15A	1800
300	*G. E.	MT-568	720
250	Westg.	HF-15B	600
200	*Westg.	CW	1200
200	G. E.	IK-15B	900
200	G. E.	IM	600
150	Cr. Wh.	50-R	1800
150	G. E.	MT-549	1800

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Cedar Rapids, Univ. & Diamond Port. CRUSHING PLANTS. Complete.
CRUSHERS: 1218 Acme, 1536 Diamond, 1836 & 2036 Univ. 2436 Lippman, 2450 Champion, 2540 CR, 3042 Buchanan, 4836 Farrell & 4248 Traylor, JAW, 7" Newhouse, 1'8" & 2'6" Traylor, 10, 14, 16 & 26" McCully, 322R & 530R Allis, 12K Gates GYR. 2, 3 & 4' Symons Cone.
MILLS: Williams Comet 4 roll, Hardinge 6x4 & 8x4' Ball, 2XB, 3XB, 4XB, 5XD Gruendler, 5040 Dixie Hammermills.
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20 ton Bridge CRANE 49' span.
Chain & Bucket Elevator 122' centers.
40 24" ga. 1½ yd. Kopple Steel Dump CARS.
SHOVELS: ½ yd. Link Belt, Lorain 75B, Link Belt K370, Lima 604, NW6, P&H 855, Manitowoc 3000, Bucyrus 51B, 170B. Lorain 820, Marion 92 & 93M.
Stokes DDS2 Rotary Tablet Machine
Repres: Bonded Scale & Machine Co.

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Model 6 N.W. Shovel 1½ Yds. Diesel
A-1 Condition

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150 ton capacity Railroad Track Scale. 4' or 4¼' Symons Standard Head Cone Crusher. 300' - 30" Conveyor complete.

BOX NO. M-124, c/o PIT AND QUARRY PUBLICATIONS
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Chicago 5, Illinois

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12—304 HP Kewanee Firebox Boilers, Model 590, 125 PSI, with oil burners & soot blowers, ASME.
4—150 HP, HRT Boilers, 150 PSI, gas fired, ASME.
1—50 HP, Titusville, 150 PSI.

COMPRESSORS

2—NEW, I.R. PRE-2, 3580 CFM, 110 PSI, 600 HP, complete.
1—327 CFM, I.R. Imperial, 100 PSI, 60 HP.
1—15,000 CFM, I.R. MTA-465, 4-stage, 20 PSI, 1450 HP Steam turbine.

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18" x 36" Jaw, Traylor, Bulldog.
14" x 16" Bartlett & Snow, 2 roll.
48" Symons, vert. disc.
42" x 14" Traylor, 2 roll.
28" x 24" Williams Impact Crusher.
18" x 18" Jeffrey, single roll.
42" Raymond, 3 roll, high side.
50" Raymond, 5 roll, high side
Raymond #1, double whizzer, complete.
Gates #5, Style K, Gyratory, 36" opening.

KILNS—COOLERS—DRYERS

11' x 75' x 5/8" Traylor.
10'6" x 112' x 3/4" Traylor.
10' x 50' x 1/2" Louisville.
9' x 80' x 3/8" Allis Chalmers.
8' x 125' x 3/4".
7' x 160' x 3/4" (2).
7' x 45' x 1/2" Link-Belt.
5'6" x 24' Lancaster
5' x 67' x 5/16".
5' x 30' x 3/8" Ruggles-Cole.
4'6" x 50' x 1/4" with lifters.
310-16 Roto-Louvre.

SCREENS

4' x 7' Tyler-Hummer, single deck.
3' x 8' Link-Belt, double deck.

HEAT & POWER CO., INC.
70 PINE ST., NEW YORK 5
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Machinery & Equipment Merchants

FOR SALE OR RENT

2—35 Ton G.E. Diesel Elec. Loco., 36" Ga.
1—25 Ton G.E. Diesel Elec. Loco., Std. Ga.
1—30 Ton Plymouth ML-6 Std. Ga. Gas Loco.
1—100 Ton Alco Diesel Electric Locomotive.
1—30 Ton Orton Diesel Locomotive Crane.
2—30 Ton Browning Loco. Cranes, Dies. & Steam.
2—1750 CFM Ing.-Rand Sys. Motor Compressors, 1952, unused.
1—50 Ton Pneu. Tire Trailer Tractor Hitch.
1—Large Lot New Spare Parts for 25 Ton Industrial Brownhoist Loco. Crane.

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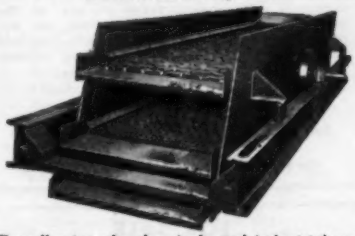

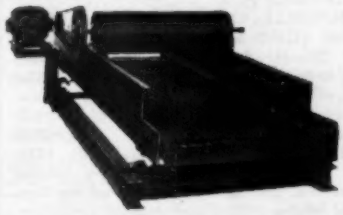

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Heavy Duty Screens from.....$1095.00 **General Purpose Screens from.....$395.00**

NEW TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. Tail pulley mounted on 2-7/16" diam. shaft. Belt is new 4-ply, 28 oz. duck 1/8" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

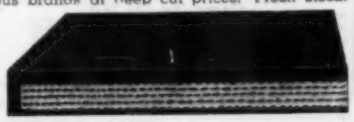
Remember, You Save Up To 50%

Belt Width	Length of Conveyor		List Price	Sale Price
16"	20'		$ 991	$ 548
16"	45'		1785	937
18"	25'		1229	684
18"	45'		1839	1005
18"	85'		3209	1665
18"	100'		3704	1912
20"	30'	(5-Ply	1453	864
20"	50'	Belt)	2189	1301
24"	25'		1322	773
24"	45'		2062	1145
24"	100'		4097	2166
24"	130'		5207	2773
30"	24'		1421	847
30"	65'		3101	1718

Other lengths & belt widths at bargain prices.

NEW CONVEYOR BELTING

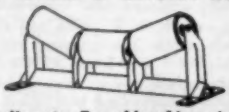
Heavy duty rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	Top Cov.	Bottom Cov.	Duck Carcass	Price
16"	4	1/8"	1/32"	28 oz.	$2.62/ft
18"	4	1/8"	1/32"	28 oz.	2.90/ft.
24"	4	1/8"	1/32"	28 oz.	3.76/ft.
30"	4	1/8"	1/32"	28 oz.	4.60/ft.
20"	5	3/32"	1/32"	28 oz.	3.95/ft.

Additional widths and plies available at low prices. Write for free samples.

NEW IDLERS & RETURN ROLLS



3-roll, 5" diameter Troughing Idlers for

16" belt	$17.25	30" belt	$19.50
18" belt	18.00	36" belt	20.25
24" belt	18.75	48" belt	21.75

1-roll, 5" diameter Return Idlers for

16" belt	$6.75	30" belt	$ 8.25
18" belt	7.13	36" belt	8.75
24" belt	7.50	48" belt	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

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25 Ton Truck Scales (Pit Type).....$ 782.00
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H.P.	RATIO	PRICE
3	20:1	$ 81.00
5	20:1	142.00
10	20:1	228.00
15	20:1	286.00
2	30:1	81.00
3	30:1	142.00
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7½	30:1	228.00
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S-444 (C) P & H Mdl. 255 (A) ¾ cu. yd. Shovel. Powered by Waukesha Mdl. MZA 86 HP 6 cyl. gasoline engine. Size 4¼x4¾ 404 cu. in. displacement.
SALE PRICE FOB
EVANSVILLE, IND. $6,950.00

S-2504 (C) Unit Pull Shovel Mdl. 1020, ¾ cu. yd., 3 way combination, crawler mounted, 24" pads and powered by General Motor 3-71 diesel engine.
SALE PRICE FOB
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S-488 (B) Buckeye Mdl. 70 Dragline with fully enclosed steel cab, crawler mounting 8'6" wide overall and 11'6" long overall with 22" treads. Powered by Chrysler No. 91 Industrial gasoline engine. Equipped w/35' boom, fairleads and Hendrix type LS ¾ cu. yd. drag bucket.
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Houseboat or office on steel barge—70' x 16' x 4' with water tank, heater, showers, toilet, excellent condition. Price is $6,000.00.

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Portable conveyor 30' x 18", powered by Wisconsin air cooled Type AHH, good condition. Price $750.00.

Pioneer Jaw Crusher 9' x 36" PB mounted on 4 steel wheels, fair condition. Price $1,000.00.

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Chevrolet truck with van body. Poor condition. $200.00.

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One (1) ¾ yd. Marion Shovel 331M-S/N 8751. Fine shape. Can be seen working—Caterpillar Engine.

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Symons 4 foot cone.
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Special bins to your specifications.
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1—Robbins Gyrex Scalping Screen 48" x 96—G.S. 7052. Including: 1 Set Mang. Steel Screen Plates 6½" x 7", 2½ Sets Mang. Steel Screen Plates 6" x 6", 1 Set Mang. Steel Screen Plates 5" x 5", 2½ Sets Mang. Steel Screen Plates 4" x 4". Good Condition..	1,500.
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1—10" Allis-Chalmers Centrifugal Pump Type-S #12966 Ft. Head 180 3400-GPM, RPM 1760, with Base and 100 HP—G.E. Motor, 440 V. — 3 ph. — 60 cy. Condition Good	1,200.
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5	Gen. Elec.	K-T 952	900	Serial #4641486 S.B.	92
5	Westinghouse	K-T 4-5-A	1800	Serial #634498 S.B.	27
5	Westinghouse	Plate missing	1180	Serial ..... S.B.	8
7½	Gen. Elec.	F.T. 958	870	Model #74-A-164 S.B.	23
7½	Watson	K.H.	1720	Serial #54900 S.B.	89
7½	Westinghouse	.....	870	Serial #4384524 Fr. 370 C-S.B.	24
7½	Westinghouse	.....	1160	Serial #4239921 Fr. 352C S.B.	39
7½	Westinghouse	.....	1160	Serial #4238793 Fr. 352C	41
10	Wagner	B.P.	1140	Serial #76830 S.B.	44
20	Howell	SCE	1200	Serial #76549 Fr. 316-E B.B. Intermittent Use	29

SLIP RING MOTORS—3 phase, 60 cycles, 440 volts

7½	Allis-Chalmers	ARY	1720	Serial #60199K-Y-711D-1-1 B.B. Fr. 284 with controls	68
40	Gen. Elec.	MT-342	860	Serial #2303593 S.B. with controls	12
40	Universal	.....	870	Serial #2367407 S.B. with controls	11
60	Westinghouse	.....	870	Serial #4317603 Fr. 648-A S.B.	2

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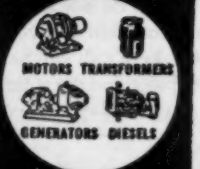

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1— 6,000# Brownie Carspotter AC
1— 5,000# Link-Belt Carspotter AC
1—20,000# Amer. Hoist Carspotter AC
1—20,000# LB Endless Puller

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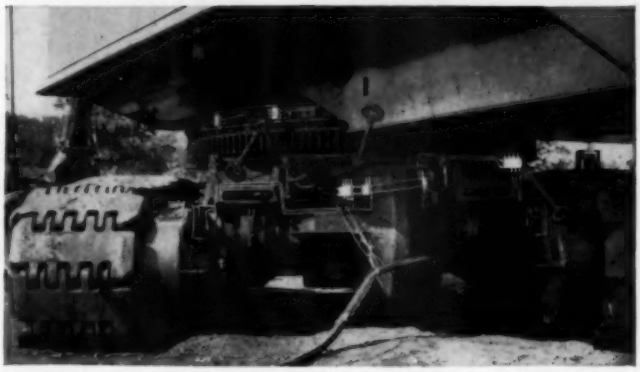

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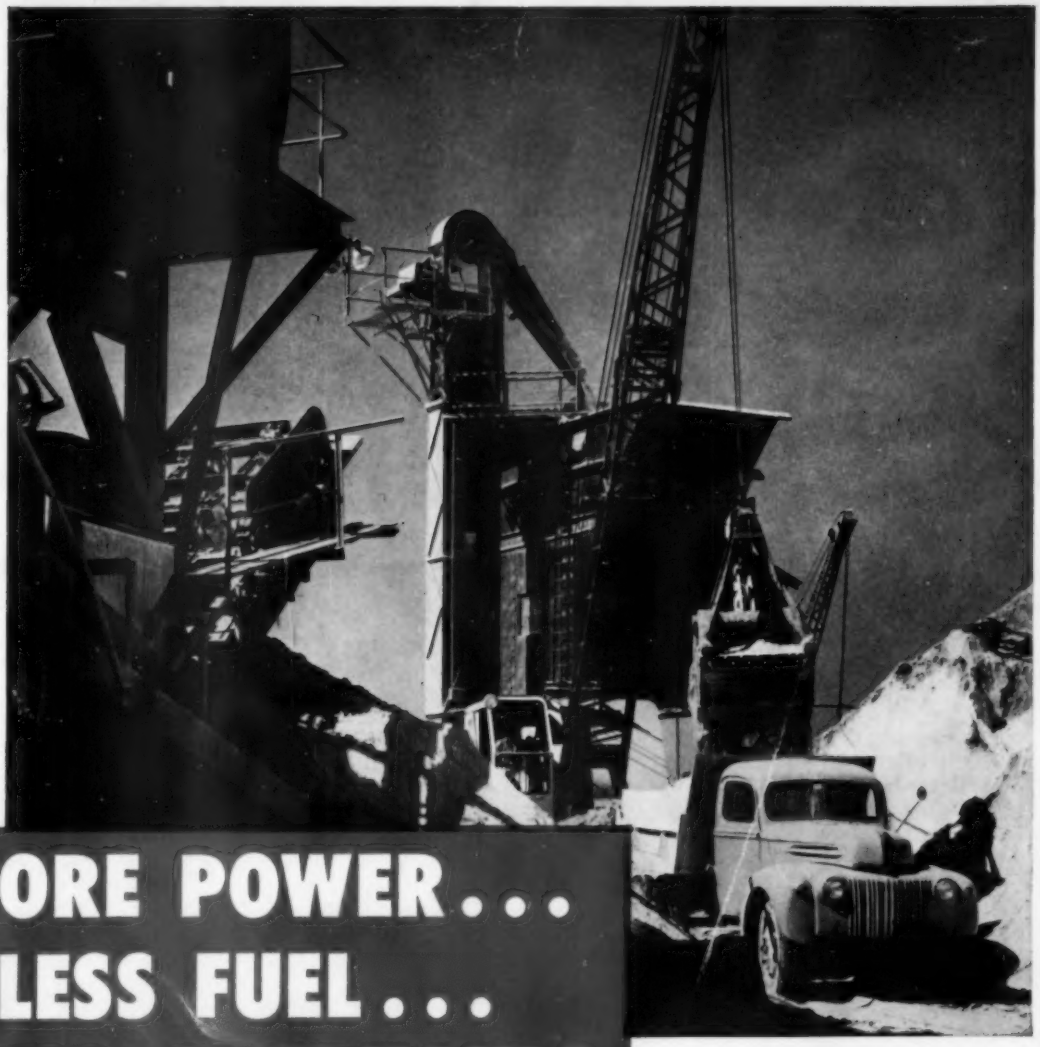

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